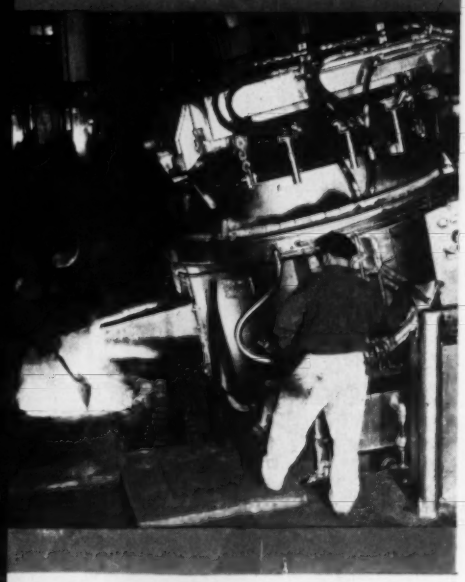
APRIL 27, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Direct Reduction of Steel Given New Look by . . .



Inventor Frank Madrigal

Iron ore and an "alloying" powder are the raw materials for this unique method of turning out finished steel in 35 minutes. Metallurgists are taking the next step. Their evaluations will show whether Mr. Madrigal, practical steelman, has made a significant breakthrough. . . . . Page 100

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What Each Side Wants as Steel Contract Parleys Begin May 5

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Here's Detail on GM Small Car

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5 Tips for Capital Goods Sellers

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New Plastic Designed to Compete With Metals in Diecastings

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Patterns Widen Plating Appeal

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Behind the Wire Fencing Story

Metalworking Outlook —PAGE 45

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YOU CAN CUT INVENTORY INVESTMENT OF MECHANICAL TUBING

If you depend on B&W and your local Steel Service Center . . . because:

. . your local Steel Service Center maintains large and diversified mechanical tubing stocks, available to you for immediate delivery

. . . your local Steel Service Center can help you cut handling and storage costs and maintain production continuity

And when it comes to mechanical tubing, ask for B&W Job-Matched Tubing. For information on how this tubing can reduce your production costs call the local B&W District Sales Office or write for Bulletin TB-352. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pennsylvania.

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Sharp eyes follow the progress of Bethlehem Rolls

Checking every detail is more than a routine habit in the making of Bethlehem forged rolls. It's done with extra thoroughness, extra care—from the early analysis of the steel to the critical inspection of the finished product.

The customer can be confident that his specifications on hardness, dimensions, and finish will always be met in full. Bethlehem never releases a roll until every technician on the job has been thoroughly satisfied.

Bethlehem forged rolls are made in every size—for every application. They are widely used in cold-rolling ferrous sheets and strip . . . running-down and finishing operations on copper and brass sheets . . . hot- and cold-rolling aluminum sheets . . . cold-rolling aluminum foil. Call us for details; we can always meet your needs.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

"Task-Forged" part reduces tractor inventory, sparks sales feature for Minneapolis-Moline

A three-in-one farm tractor that permits quick interchange of three different front wheel assemblies! Minneapolis-Moline came up with this great idea for increasing product salability and reducing inventories—both at the factory and with its dealers.

Key part in the multi-purpose unit was a steering link component. It had to be strong enough to steer and support the front end of the tractor—including the various wheel assemblies—yet light enough for one-man handling. A forging? Of course! Minneapolis-Moline designed it as a drop forging because it had an unusual dovetailed groove in the head and an off-center shaft to boot.

The "Task-Forging" team at COMMERCIAL, working closely with Minneapolis-Moline engineers, proved that the "idea" steering link component could be better produced as an upset forging on their 6" upsetter—and with many cost-saving advantages to Minneapolis-Moline.

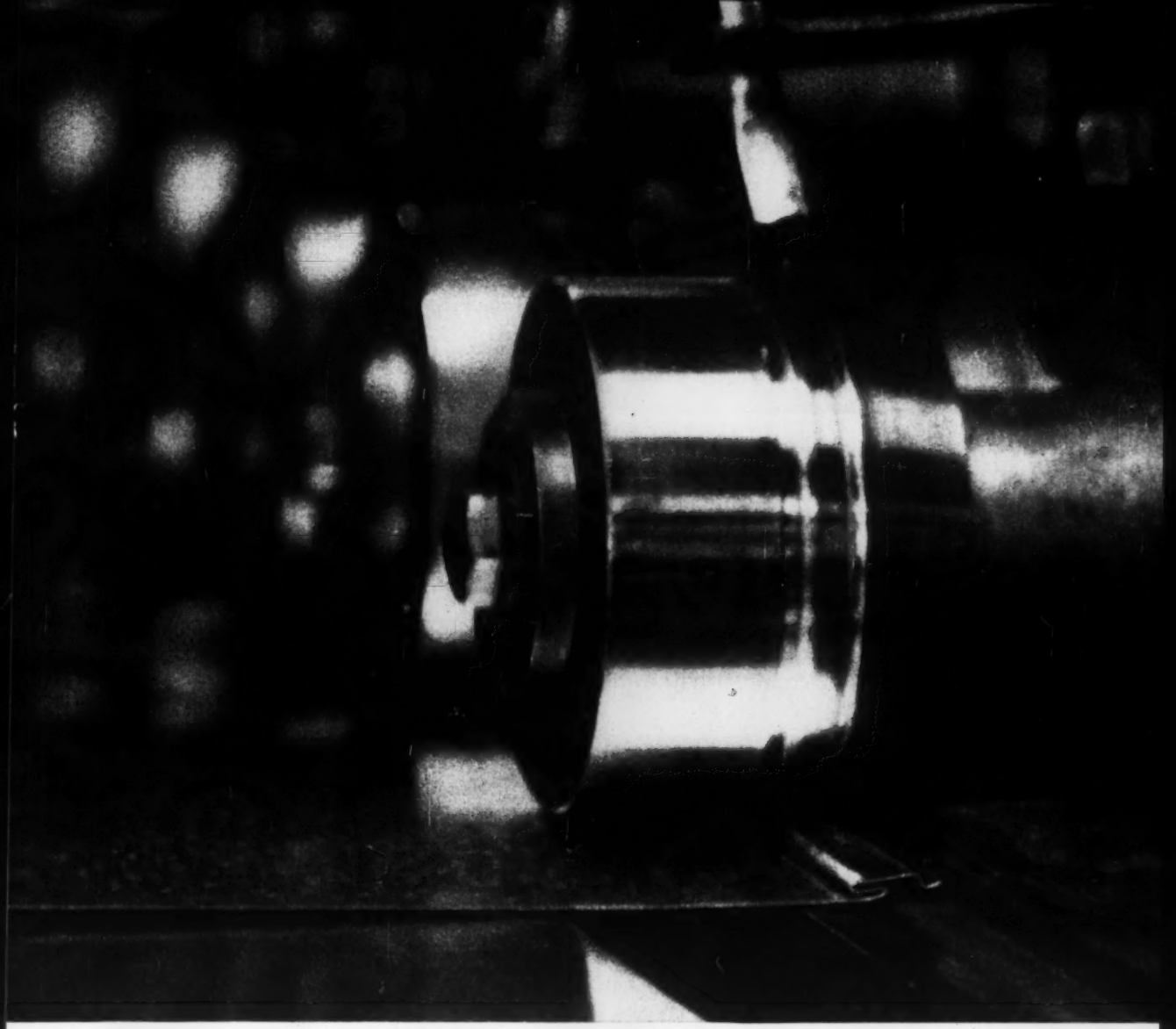
To begin with, the upset forged link saves considerable forged metal. All flash metal is virtually eliminated. Still more forged metal is saved because the upset forging is made from a round bar—involves no forging draft.

The upset forged link lowered machining costs and greatly improved machining conditions. There's less metal to be machined and it's better positioned for easier removal. Furthermore, there's no heavy part line at 180° to cut through. Tool breakage is no problem either because tool speed and feed is constant and continuous.

From an upset forging of 27 lbs. to a finished machined part of 22½ lbs. —there's positive proof of the important savings forging makes possible in both forged metal and machining.

Perhaps you're looking for help in the forming of a new "idea" part. Or, you may be seriously considering an improvement in the forming of an already existing part. In either case, "Task-Forging", COMMERCIAL's new metal forming service may be able to help you. Write to Commercial Shearing & Stamping Company, Dept. L-18, Youngstown 1, Ohio.

COMMERCIAL
shearing & stamping



"LOCK SEAMS GIVE US TROUBLE? NO SIR—WE USE WEIRKOTE!"

When it comes to the rigors of lock-seaming, nothing can take it like Weirkote.

Why? Because Weirkote combines the strength of steel with a tightly bonded continuous process zinc coating that remains intact through the severest fabricating steps. No chipping. No peeling. In fact, Weirkote can be worked to the very limits of the steel itself and still come through with a smooth, even, corrosion-resistant zinc coating on both sides of every crease.

So whether your product is crimped or drawn, spun or twisted, Weirkote means a new high in production results, corrosion prevention and customer goodwill—a new low in costly, worrisome rejects.

Weirkote's low initial price, combined with these production savings, insures the economical quality you may have been looking for. Why not investigate further by sending for the 12-page Weirkote booklet that explains how Weirkote can help you both in your products and in your production. Just write to Weirton Steel Company, Dept. B-13, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

Handling a hot job at a cool $1400-a-year saving

They don't spare the belts around busy foundries like this one in the Midwest. And their shakeout conveyor was in a specially hot spot—handling smoking sand at temperatures well over 250°F, occasionally reaching a near-incandescent 450°F. Little wonder belt life averaged only 43 days.

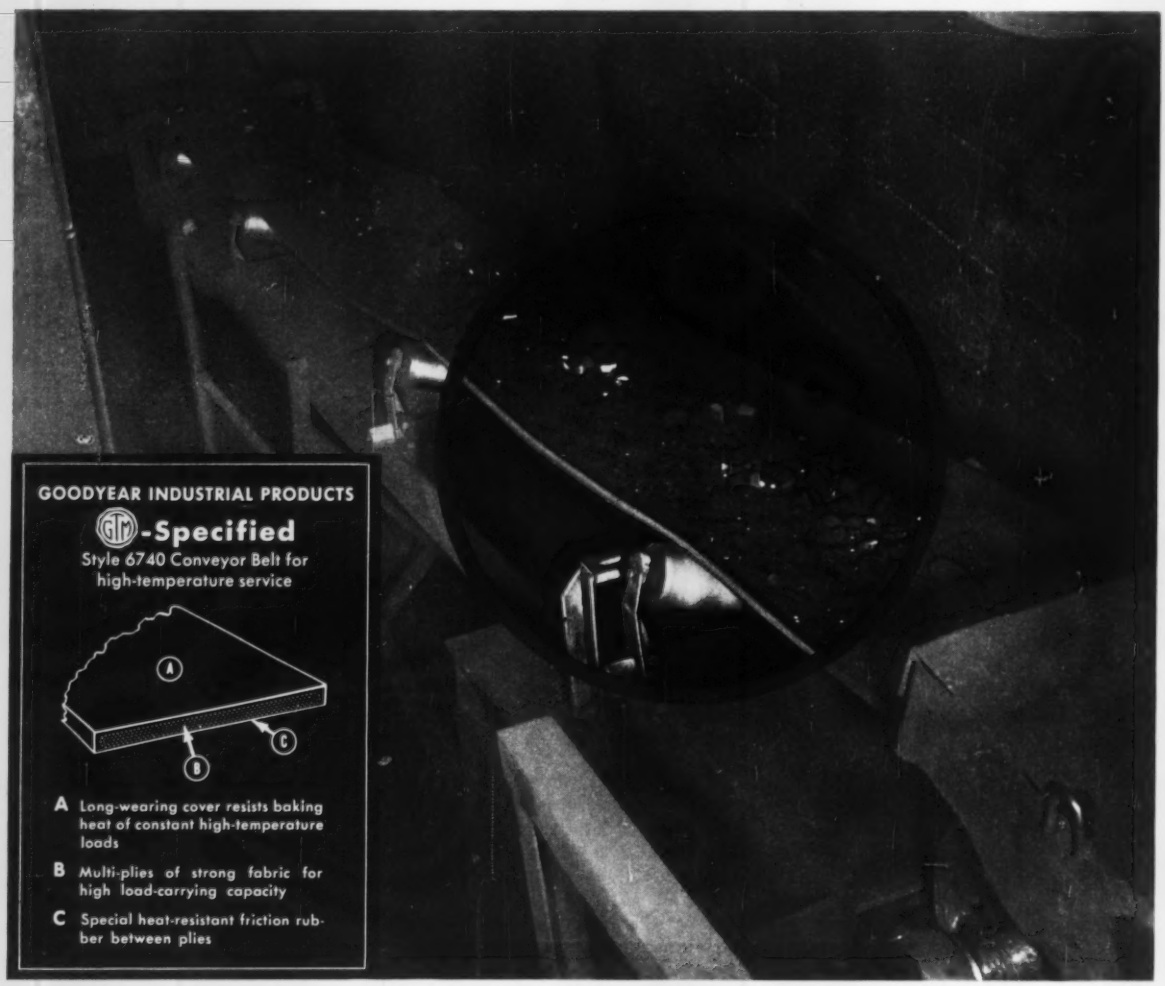
But that was before the G.T.M.—Goodyear Technical Man—appeared on the scene. His recommendation: Style 6740 conveyors especially designed to resist the usual cracking, charring effects of "cooking" heat.

The results: carefully kept records showed a succession of 5 of the G.T.M.'s belts averaging 154 days apiece—*more than 3½ times previous service.* And that meant a yearly saving of exactly $1,435.40.

Isn't this the kind of dollars-and-cents improvement you'd like to make in your shop? If it takes industrial rubber, the G.T.M.'s your man. Contact him through your Goodyear Distributor—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

• • •

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and non-rubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*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GTM-Specified
Style 6740 Conveyor Belt for high-temperature service
A
B
C
A Long-wearing cover resists baking heat of constant high-temperature loads
B Multi-plies of strong fabric for high load-carrying capacity
C Special heat-resistant friction rubber between plies

CONVEYOR BELTS BY

GOODYEAR

THE GREATEST NAME IN RUBBER

This Week in STEEL

The Metalworking Weekly

April 27, 1959
Vol. 144 No. 17

EDITORIAL 51

Spread of Communism is bigger and more immediate threat to us than war with Soviets.

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Meet Frank Madrigal

He's the inventor of the Madrigal process described in the story headed, "From Iron Ore to Steel in 35 Minutes," in this issue. STEEL editors who saw ore reduced directly to steel and cast into an ingot report on the test.

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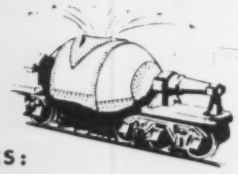

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behind the scenes

Some Words of Wisdom

STEEL presents so much interesting material each week it's difficult to point to any single item and say, this is it! The superintendent of a machine shop is more likely to be intrigued by a story describing shortcuts in machining difficult alloys than he would be in an editorial on foreign investment, but that's because his primary interest is in machining problems. On the other hand (Goodness gracious! Where would we be if the expressions "on the other hand," "in other words," and similar syllabic workhorses were stricken from the language?) . . . On the other hand, a reader like Roger M. Blough would probably skip a story on diecasting and settle for something on market analysis.

You know that Mr. Blough's name didn't fall here purely by happenstance. We threw it in on purpose because we aim to quote something he said in his capacity as chairman, United States Steel Corp. Most people come smartly to attention when his name is mentioned because of his high office; we come to attention because he makes plenty of sense.

In an introduction to a book, *Steel and Inflation, Fact vs. Fiction*, published by U. S. Steel in 1958, Mr. Blough came out with a lot of plain talk. It has always been a matter of great wonderment why facts and common sense rate such poor attention in the world, whereas distortions and hysteria rate wide acceptance.

"Rising prices," said Mr. Blough, "do not cause inflation; they are the result of inflation. As a knowing friend of mine put it: 'Price increases cause inflation like wet streets cause rain.'" Speaking about wage increases, Mr. Blough said: "First, no one company, no one industry, and no one union can alone stop the march of inflation. Second, neither the steel industry nor any other industry ever sets the wage pattern in America. Third, a cut in steel prices produces no identifiable effect upon the cost of living."

The deadline for the steel strike is yet some weeks away, but we are all moving toward it inexorably. Because powerful groups of men hold different opinions, we have revolutions, wars, strikes which never really settle anything. So there will be a steel strike, and the workers will get a raise, and steel producers will be forced to raise their rates to remain in business, and other unions will demand increases, and their employers will be obliged to kick up their rates, and your dollar will be even sicker than it is now.

All this is known, and has been demonstrated time and again, yet modern man pursues the phantom dollar as blindly as Ponce de Leon pursued his fabled fountain. The steel strike and resulting inflation are so certain, panhandlers have already discarded the dime as a medium of exchange, and are rehearsing the new greeting: "Say, Mac, can you gimme a quarter for a cuppa cawfee?"

The Market Finders

Some economists have termed the recent business readjustment period the capital goods recession. An article beginning on Page 58 describes how some capital goods makers have developed new markets.

We have the urge to be whimsical, but there is nothing whimsical about the case studies illustrating the resourcefulness of the capital goods makers interviewed by STEEL. One company had its own gimmick in the shop for 15 years, and when it decided to market it, it sold like crazy. Another company took advantage of the lull in business to intensify efforts toward the development of new lines. Its aim: To market them after the recession. The things are already selling.

This article may give you ideas.

Governor Boots This One

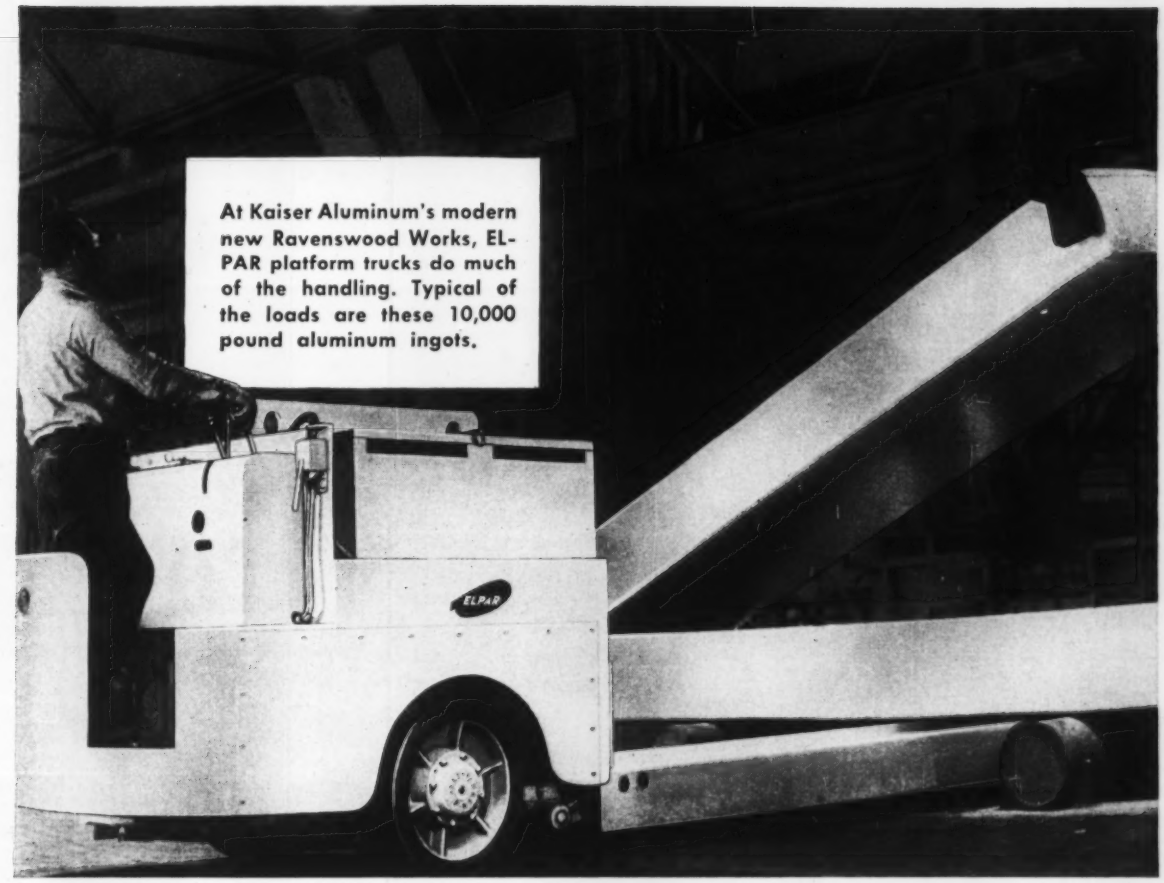
We are always impressed, at baseball games, by the manner in which the catcher rushes from his station to back up a play at first. If a mistake is made, that boy is right there to make things as right as possible. STEEL is fortunate in having sharp eyed readers who act as catchers; they are quick to straighten us out when we flounder around in left field. On Apr. 6 we lightly implied that "opi" was the plural of "opus," and almost before you could dig up your garden, readers in Ontario and California reminded us that the correct plural is "opera."

E. J. Martin, Peterborough, Ont., and James J. Mulvey, editor of the *Ryan Reporter*, Ryan Aeronautical Co., San Diego, Calif., chided us gently because of the slip.

Well, there's no doubt about it: They caught ol' Shrdlu flat-footed that time, all right. We hate to think that there is no such word as "opi." Surely it must have been used by someone, somewhere; for all we know, it might be an Algonquin prefix, or a Hottentot suffix. A use could be invented, of course. The scene is the palace of the Roman governor in Jerusalem. The governor enters his wife's drawingroom, and stumbles over a footstool. "Oh, Pi!" she exclaims. "Lift them big feet!"

Shrdlu

(Metalworking Outlook—Page 45)


At Kaiser Aluminum's modern new Ravenswood Works, ELPAR platform trucks do much of the handling. Typical of the loads are these 10,000 pound aluminum ingots.
ELPAR

ELPAR platform trucks– SLASH HANDLING COSTS ON BIG-BULKY LOADS

Ideal for handling bulky, extra long or irregularly shaped loads, ELPAR platform trucks are the safest and most economical trucks for horizontal hauls.

Because the load is supported by wheels under the platform — vs. fork trucks that carry loads cantilever fashion — you can handle bigger pay loads on a smaller truck. Result: Initial cost can be cut as much as 30%.

Another advantage — ELPAR platform trucks are simpler in design. Thus, maintenance costs are as much as 25% less than the average fork truck of similar capacity.

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Lincoln

WELDYNAMICS

NEWS ABOUT ARC WELDING AT WORK CUTTING COSTS

A "Squirt" Welder welds heavy plate in 1/4 the time.

WAR AGAINST HIGH COSTS NETS BARGE BUILDER 75% BONUS

The Wiley Manufacturing Company of Fort Deposit, Maryland, builder of welded barges and large custom built cranes, initiated a cost reduction program that resulted in real savings.

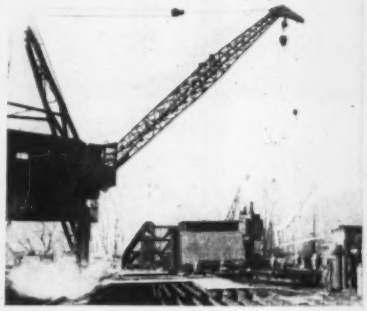
Stanley Welsh, general superintendent, and J. J. Evans, general foreman, faced with ever rising labor costs, decided bold action was necessary if the company was to keep prices competitive. Since welding is the largest single operation in the Wiley yards it was only logical that they should look for a way to reduce welding costs first.

Enlisting the aid of Joe Gulley, a Lincoln welding engineer out of Lincoln's Baltimore office, the Wiley men began a detailed survey of their welding procedures and processes.

Mr. Gulley assisted Mr. Evans and his weldors to analyze the methods and electrodes used for welding sub-assemblies and for joining the sub-assemblies to the main structure. It was found that by positioning the smaller units iron-powder Jetweld electrodes could be used and speed increased considerably.

The jack-pot, though, was won by switching to semi-automatic for welding of heavy plate. By using a Lincoln "Squirt" welder propelled on a gas cutting buggy, Wiley is able to weld heavy plate, up to ¾ inch, in ¼ the arc time previously required to weld it manually.

Welded units form the barge on the ways.



Structural members are fabricated on the ground with Jetweld, then welded into sub-assemblies.

Jack Evans, General Foreman at Wiley, sparked a cost reduction program that succeeded.

Mr. Evans states that these savings are made even greater because very little plate preparation is necessary. Bevel is eliminated in plate up to ½" and weld cleaning is greatly simplified. The resulting welds are better, too, than can be made manually.

The result—a 75% saving in arc time on this operation!

Although no overall cost figures were immediately available, Mr. Evans estimated that they had been able to reduce total welding costs by at least one third.

The LINCOLN ELECTRIC CO.
Dept. 1651, Cleveland 17, Ohio
The World's Largest Manufacturer
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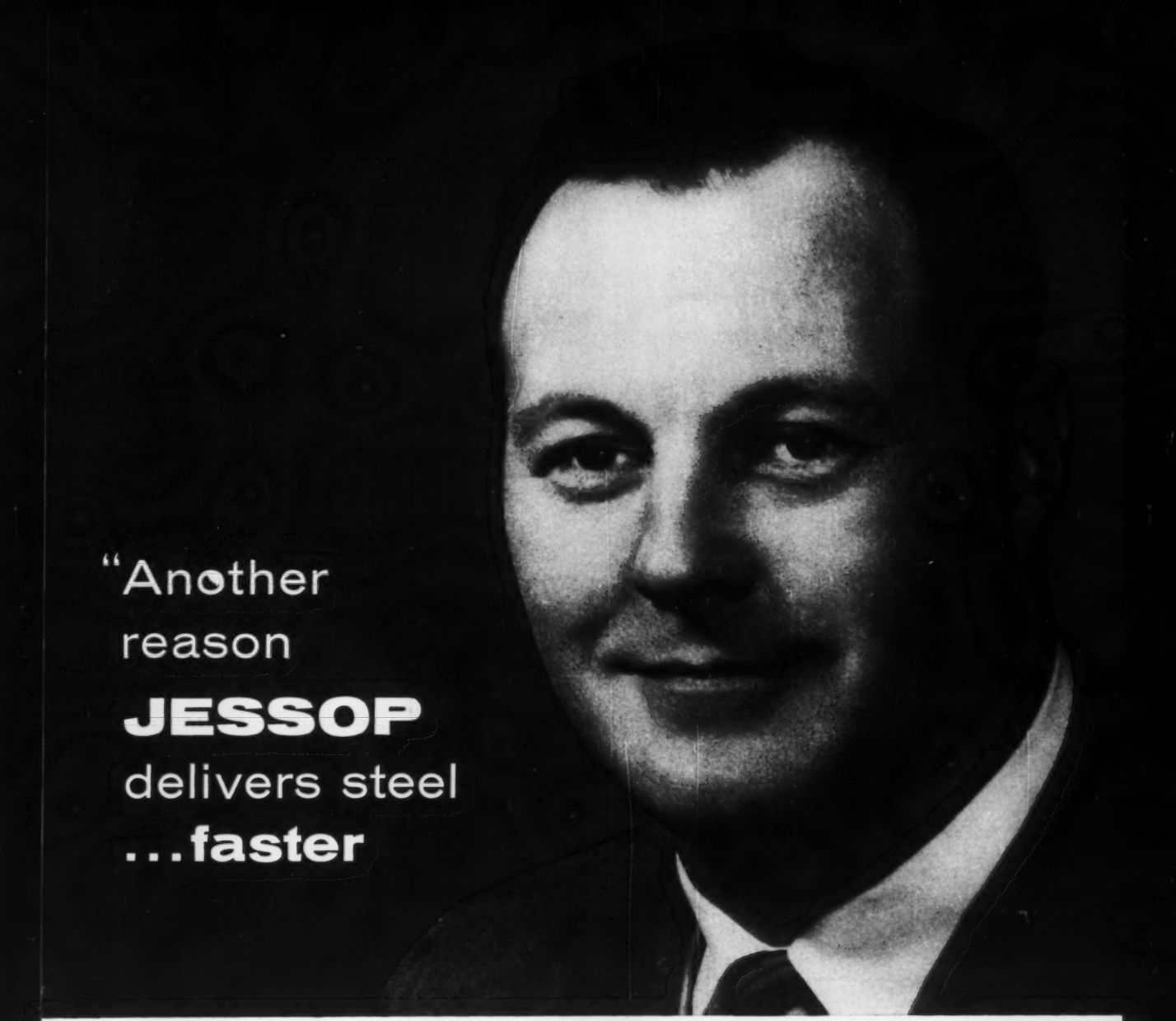

"My name is Jim Daniell. I'm president of Green River Steel, a subsidiary corporation of Jessop Steel Company.

"Talking to you through the medium of advertising is kind of new to me but it does give me the opportunity to say that our management team believes in action . . . we've learned that flexibility is our most important advantage.

"You already know that our completely integrated mills have the capacity that means faster delivery of your high quality specialty and alloy steels. You know, too, that Jessop and Green River are leading producers. Add to this the fact that our organization is streamlined, compact and free of complacency—and you have another reason why Jessop can give you better and faster service.

"It seems to me the next logical step is to ask for your order . . . we would like to do business with you."

VMA 6528

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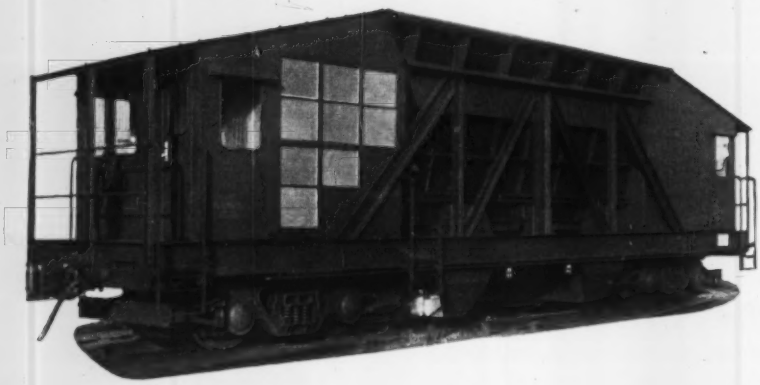

75-ton diesel-electric transfer, single hopper, bottom dump with air-operated discharge gates and double-end control.

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LETTERS
TO THE EDITORS

Executed

In the Feb. 23 issue, p. 5, your boy Shrdlu "writ a pome." It was done in the style of Robbie Burns and was cleverly executed. My copy of it was also cleverly executed. I think perhaps it was deported rather than executed.

May I please have another copy of this poem? This time we'll fool 'em. Send it to my home address.

Robert H. Ridgway Jr.
Downers Grove, Ill.

Finds Facts in Job Case

We certainly enjoyed "The Case of the Vanishing Jobs" (Apr. 6, p. 99). Although some humor was injected into the article, you provided your readers with a great many facts.

Will you send us two copies? We would also like to have permission to publish and quote this article in our weekly house organ.

Congratulations on the interesting material you are putting before your readers.

R. S. Miller
Director
Personnel & Public Relations
Locke Mfg. Co.
Lodi, Ohio

• *Permission granted.*

. . .

Not only the content but the dramatic way in which the information was presented gives this article an impact that should make many stop and think.

J. G. Everhart
Vice President and General Manager
Illinois Edison Porcelain
McGraw-Edison Co.
Macomb, Ill.

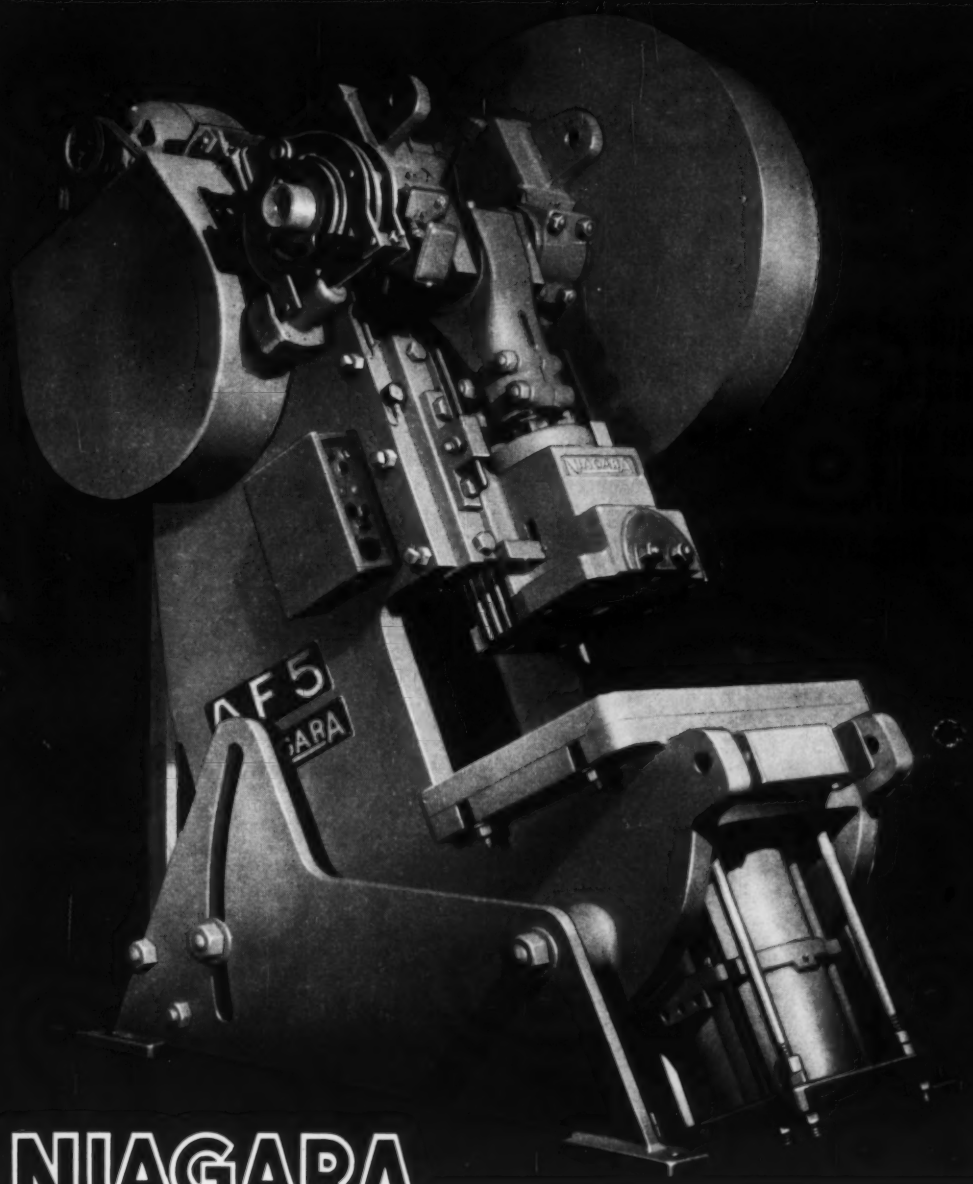
. . .

May I please have several copies of this article?

It may interest you to know that a citizen of a European country who resides in the U. S. recently placed an order for

(Please turn to Page 12)

A GREAT NEW LINE* JOINS NIAGARA'S BIG OBI FAMILY



NIAGARA

Meet the new Series AF. Look it over . . . typical Niagara engineering from crown to base . . . every detail a benefit to you.

- Rugged, rigid frame for greater accuracy, longer die life.
- Unusually long, rigid slide of unique design prevents deflection of ways, solidly supports dies and extends their life.
- Exclusive multiple "V" gibbing for more guiding surface and greater resistance to off-center loads.
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- Simplified control for safer, time-conserving press operation.
- Patented one-man inclining mechanism.
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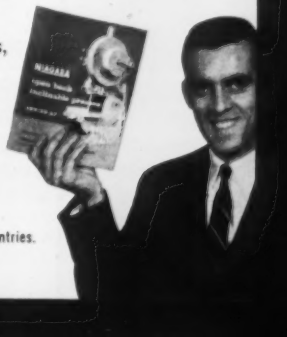
Niagara Machine and Tool Works, Buffalo 11, N. Y.

Now get the whole story . . .
Send for New Bulletin 55.



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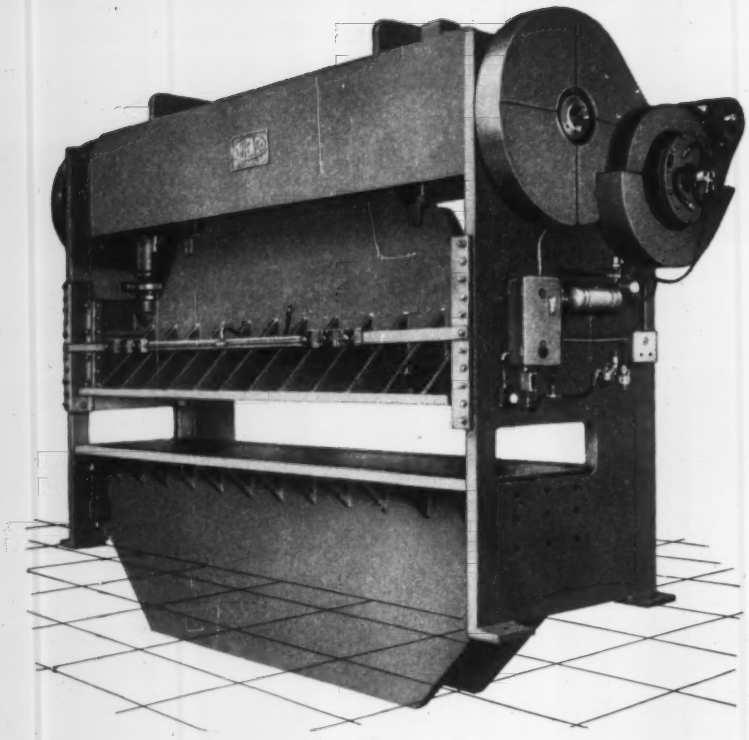

CHICAGO DREIS & KRUMP

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STRAIGHT-SIDE TYPE

large die area

capacities up to 400 tons

This is a typical model of CHICAGO straight-side-type presses used for multiple punching, notching, and trimming operations. This press with a die area of 48 inches by 198 inches has a capacity of 200 tons.

Complete recommendations for any job on request.

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LETTERS

(Concluded from Page 10)

merchandise to be shipped to Europe. This involved less than $500. The local consulate for this buyer's country told him, "You had no business purchasing a product in the United States just because is costs less money; what would happen to the people in *your* country if this went on?"

Albert Zoraster
President
West Van Nuys Chamber of Commerce Inc.
West Van Nuys, Calif.

Seeks Meeting Information

As a steady reader of STEEL, let me congratulate you on your continually fine publication.

Each issue has a section called "Calendar of Meetings" in which association meetings for the following month are listed. Could you tell me where I can obtain a schedule listing these meetings a year in advance?

Frank R. Chase
Vice President
Torit Mfg. Co.
St. Paul

• *The first issue each year carries a list of association meetings scheduled throughout the year.*

Informative Article

Will you please send me a copy of your informative article, "Electric Furnaces To Gain in Direct Reduction of Ore" (Mar. 16, p. 122)?

Patrick Lichner
Economist
Lionel D. Edie & Co. Inc.
New York

Gives Complete Answer

May we have four copies of "Continuous Casting, Impact Extrusion Spark Revolution in Aluminum Partmaking" (Jan. 12, p. 70)? We have had several requests from foreign sources for information and find that this article gives the most complete answer.

R. J. Hartmeister
Project Engineer
Coors Porcelain Co.
Golden, Colo.

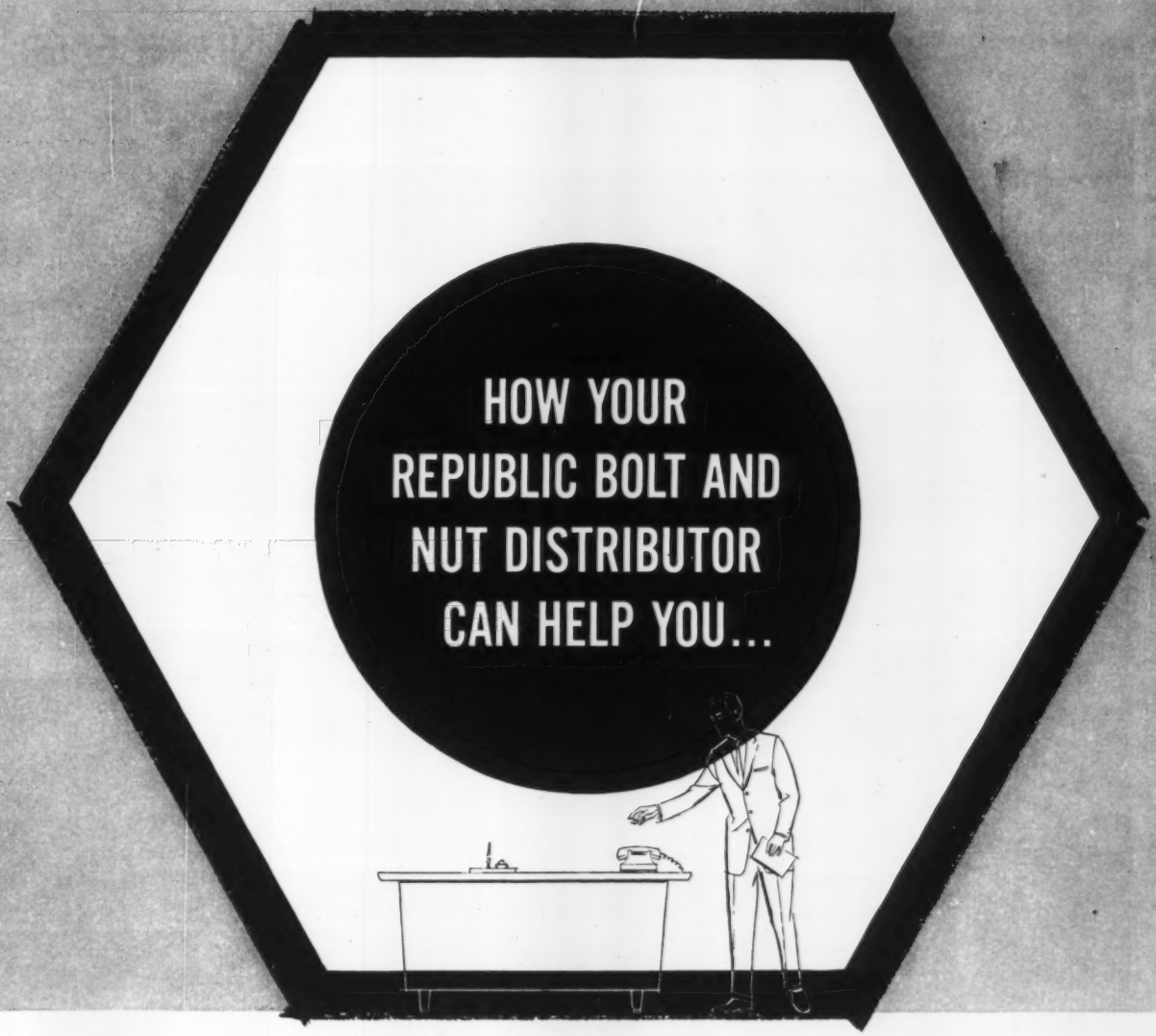
Cheaper Argon?

In Technical Outlook (Mar. 16, p. 113), you stated that welders and metal processors may be able to buy argon for 5 cents a cubic foot next year.

Would you please advise where argon can be obtained at this price?

S. B. Dunne
Plant Manager
Murray Tube Works Inc.
Elizabeth, N. J.

• *A major supplier of argon says cheaper argon prices will depend on quantity. If your needs are great enough, you will be able to qualify.*



Employ the know-how of fastener-industry experts

No matter how effective your present fastening methods may be, there is always the chance that you can do the job more efficiently and more economically, without sacrificing quality or strength. A consultation with your local Republic Bolt and Nut Distributor, and his staff of fastener specialists, may point the way.

Keeping abreast of developments and trends in the fastener industry is a vital aspect of your local distributor's business. In doing so, he is backed up by the know-how of the experts at Republic Steel—a company whose fastener background spans a century. This experience is at your command.

Your local distributor is a vital cog in today's industrial system—ready to help you at any time in any way he can. His skill at maintaining large and diversified fastener inventories, in all types and sizes, materially reduces your own overhead and production costs.

Whether you need specialized information, quick deliveries of fasteners in any quantity, or one of the many other services he offers you, it will pay you to get in touch with your local Republic Bolt and Nut Distributor. Telephone him now.

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REPUBLIC Bolts and Nuts

REPUBLIC STEEL

REPUBLIC ELECTRUNITE

world's widest range of SPECIALTY WELDED TUBING

STAINLESS and CARBON

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HEAT EXCHANGER, CONDENSER AND EVAPORATOR — Full Range of Sizes and Analyses

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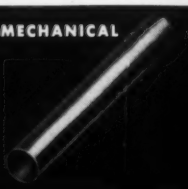

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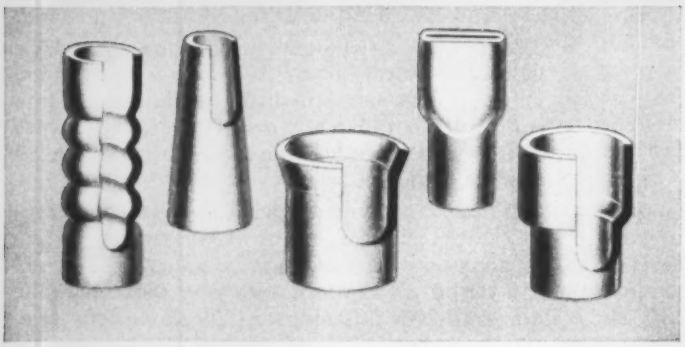


REPUBLIC ELECTRUNITE MECHANICAL TUBING is easily fabricated and formed by the user or through the fabricating and finishing facilities of Republic's Steel and Tubes Division. Round tubing can be furnished flanged, swaged, flattened, fluted, spun, configured, upset, rolled, and otherwise changed in cross-section to meet an endless variety of design requirements. Write for illustrated brochure.

Republic ELECTRUNITE® offers you the world's widest range of stainless and carbon tubing. Carbon steel round tubing in sizes up to 6" O. D.—squares and rectangles in peripheries up to 20". Stainless steel tubing in sizes up to 5" O. D.—squares and rectangles in peripheries up to 16". And a complete range of stainless pipe sizes.

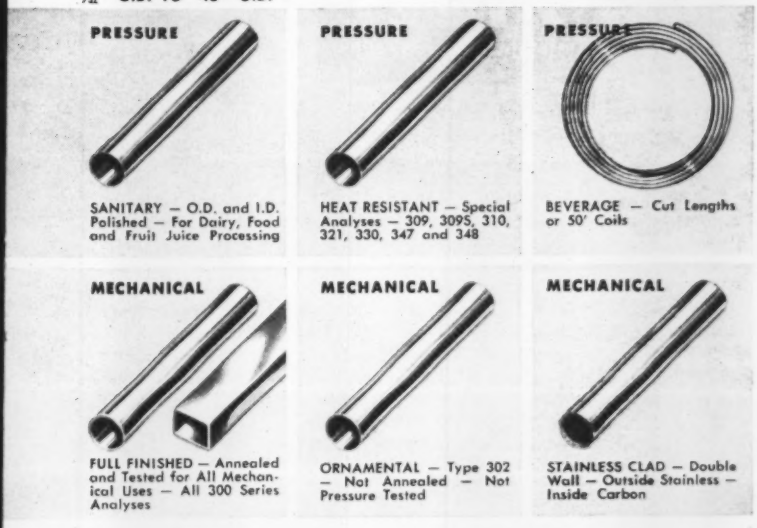
ELECTRUNITE is quality controlled from ore to finished product. Produced in Republic's own mills to rigid requirements.

Welded by the exclusive ELECTRUNITE process—a continuous electric-weld method that unites the wall under pressure without the addition of foreign or extra metal. Tests prove the weld is as strong or stronger than the original base metal.

Next time you need tubing, whatever the application or problem, call your Republic representative. Or, write direct.

STEEL TUBING AND PIPE

1/32" O.D. TO 40" O.D.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HEAT RESISTANT — Special Analyses — 309, 309S, 310, 321, 330, 347 and 348
PRESSURE
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FULL FINISHED — Annealed and Tested for All Mechanical Uses — All 300 Series Analyses
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STEEL TUBING

1/8" O.D. THROUGH 6" O.D.

MECHANICAL
STRUCTURAL—Squares, Rectangles and Special Shapes within periphery of 1" thru 20"
PRESSURE
HEAT EXCHANGER AND CONDENSER — To A.S.T.M. — A-214 — To Customer's Special Specifications
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BOILER TUBES—To A.S.T.M. A-178 and Government Specifications
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HYDRAULIC LINE — 3/8" O.D. and Larger
REFRIGERATION
REFRIGERATION—Complete Size Range
MECHANICAL
FABRICATION — All Types of Fabrication Available

SIZE—GAGE RANGE CHART
ROUND TUBING

Outside Diameter of Tube	Wall Thickness (B. W. Gage)	
	Carbon Steels	Stainless Steels
	Mechanical Tubing	Mechanical Tubing
1/4"	.....	16-25
3/8"	18-22	16-25
7/16"	16-22	16-25
1/2"	16-22	14-25
9/16"	14-22	14-25
5/8"	14-22	14-24
11/16"	14-22	14-24
3/4"	9-22	13-24
13/16"	9-22	13-24
7/8"	9-22	12-23
15/16"	9-22	12-23
1"	6-22	11-23
1 1/16"	6-22	11-22
1 1/8"	6-22	11-22
1 3/16"	6-22	11-22
1 1/4"	6-22	11-22
1 5/16"	6-22	11-20
1 3/8"	6-22	11-20
1 7/16"	6-22	11-20
1 1/2"	6-20	10-20
1 9/16"	6-20	10-20
1 5/8"	6-20	10-20
1 11/16"	6-20	10-20
1 3/4"	6-20	10-20
1 7/8"	6-20	10-20
2"	6-20	9-20
2 1/16"	6-20	.....
2 1/8"	6-20	9-20
2 3/16"	6-20	.....
2 1/4"	5-20	9-20
2 3/8"	5-18	8-20
2 1/2"	5-18	8-20
2 9/16"	5-18	.....
2 5/8"	5-18	8-20
2 3/4"	.250"-18	8-20
2 7/8"	.250"-18	8-20
3"	.250"-18	8-20
3 1/4"	.250"-18	8-16
3 1/2"	.250"-18	8-16
4"	.250"-16	8-16
4 1/8"	14-16	.....
4 1/2"	.250"-16	8-16
5"	.250"-16	8-16
5 1/2"	.250"-16	.....
6"	.250"-16	.....

Above are common available sizes. Intermediate sizes also available. Tubes are manufactured by several processes in accordance with the size-gage ratio; therefore not all sizes and gages are readily available in all grades of product. Please contact your nearest Steel and Tubes Division Representative for delivery information on specific size, gage, and grade desired.

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World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
DEPT. C-7682
253 EAST 131ST STREET • CLEVELAND 8, OHIO

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- ☐ Stainless Steel Pipe . . . . Type_____
- ☐ Carbon Steel Tubing . . . . Type_____
- ☐ Please have a Republic Engineer call.

Name_____ Title_____

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Address_____

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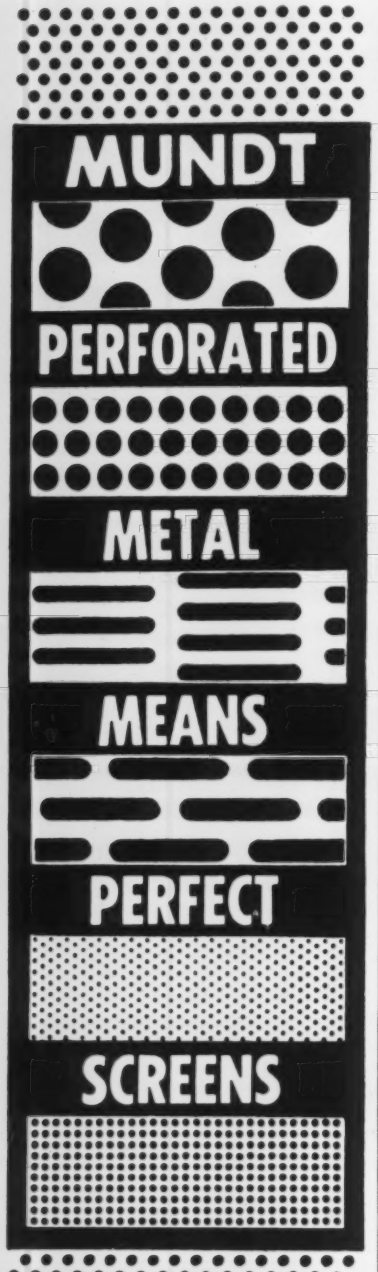

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Savings in chromium and silicon costs for open-hearth steels can be made with new ELECTROMET high-silicon refined chrome. A very low-cost source of chromium, the alloy also provides 11 per cent silicon for blocking. Savings of approximately $1.00 per ton can be made over practices using exothermic ferrochrome in the ladle.

When used for blocking, high-silicon refined chrome dissolves readily and gives tight blocks for the full time required with no phosphorus reversion. Consistently high chromium recoveries have been reported. For further details, contact your UNION CARBIDE METALS representative.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

A one per cent chromium addition adds approximately 0.25 per cent silicon.

UNION CARBIDE METALS

***Electromet** Brand Ferroalloys and other Metallurgical Products*

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timbre tester

Steels, like men, have different personalities. Years ago this mysterious something in steel was referred to as "body", "nature", or "character" . . . until 1930, when *Carpenter* researchers, borrowing a term from music, called it *timbre*.

Today, *timbre* is the common term steel men use when they refer to the still-mysterious but now-controllable property of tool steels, that determines grain size and toughness.

It was only natural that *Carpenter's* designation received immediate and general acceptance. For by that period in 1930, *Carpenter* was firmly established as a pioneer in the research and development of *fine quality steels.*

For many years, demands by American industry for *Carpenter*-quality stainless, tool and alloy steels often exceeded our ability to produce. Like that of all custom-craftsmen, our objective was *quality*, the pioneering of new and better steels, rather than *quantity.*

Within the past year, *we have doubled our ingot tonnage capacity.* Today, as the result of long-planned expansions, we can offer *quantity* along with famous *Carpenter quality.* For the first time, both are now available. And both will continue to be available . . . even in times of peak demand.

While *quality* will continue to remain a sacred *Carpenter* watchword, we are determined to lead the way and grow apace of the ever-increasing demands of industry for the world's finest steels.

Carpenter will continue to meet the *timbre test.*

tool and die steels
stainless steels
electronic and magnetic alloys
special-purpose alloy steels
valve, heat-resisting and super alloy steels
tubing and pipe
fine wire specialties

Carpenter steel

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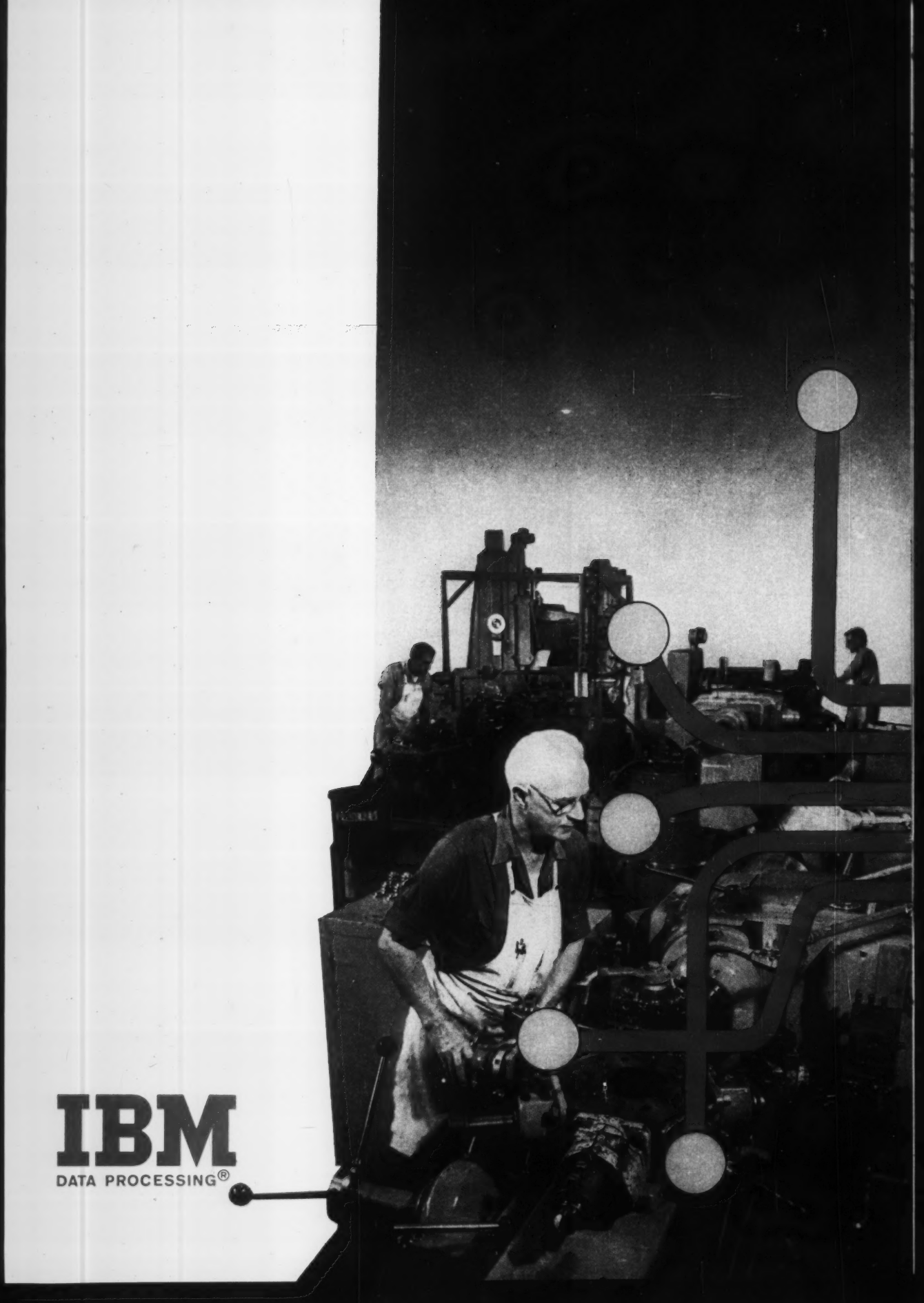

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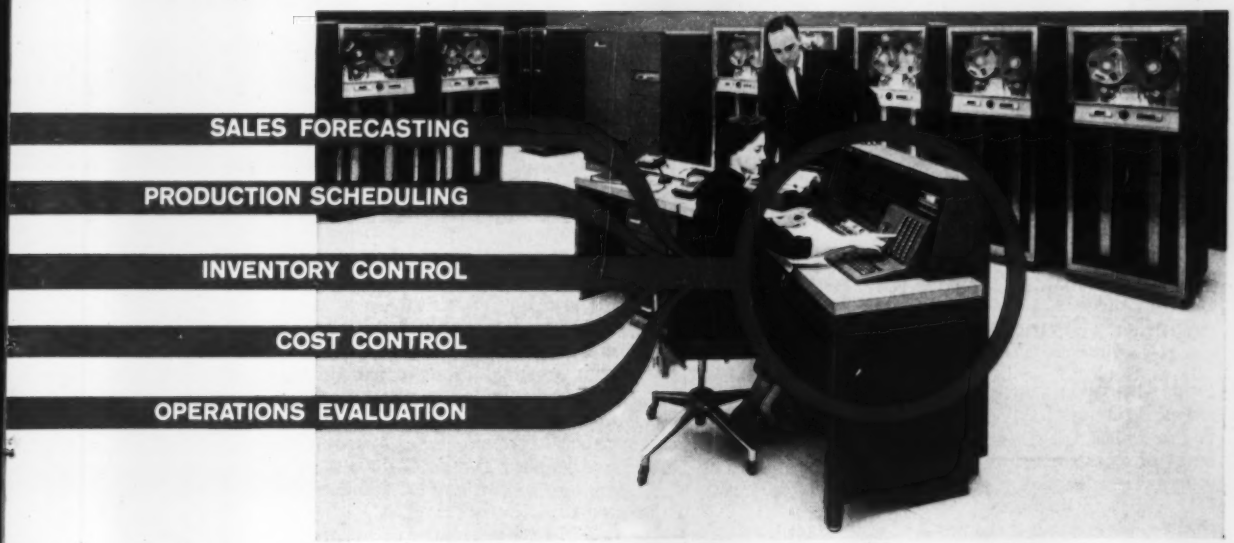


Now . . . through IBM data processing . . . large and small companies can control manufacturing operations with precision. Manpower, materials and machines are used where you want them, when you want them, in quantities you want for the optimum scheduling.

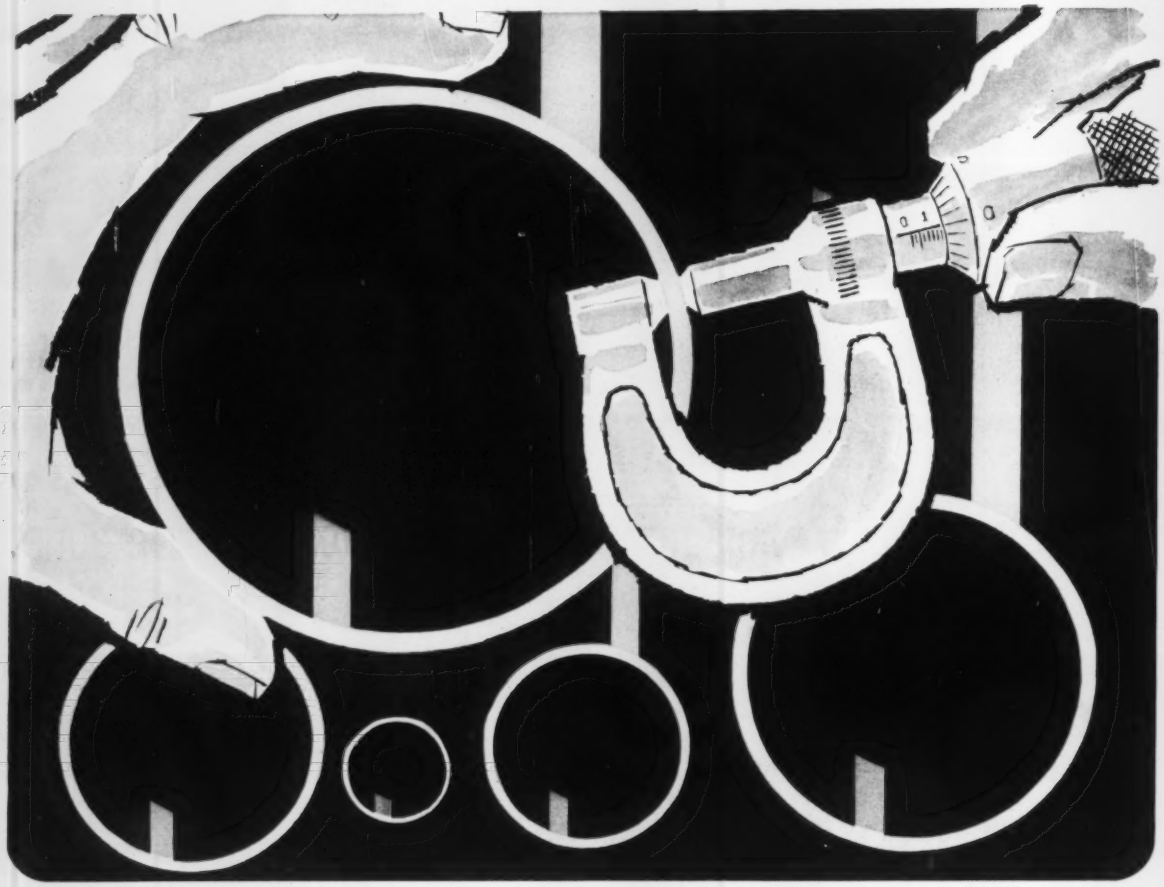
With new abilities to record, process and evaluate current data, your manufacturing management can base requirements directly on market demands. Decisions are swiftly reflected all the way back through assemblies to parts and raw materials, manpower and machines.

Applied to inventory control, production scheduling, sales forecasting, and cost control, this new method brings tighter control and substantial operating savings. Now, new techniques such as job shop simulation become practical and enable you to look into the future with a minimum of trial and error.

Typical results of the application of this IBM method: One manufacturer does a complete monthly material requirements breakdown for the next twelve months in just twelve hours; service parts production is calculated in just one hour; perpetual inventory updated on a daily basis in one hour. Other controls include weekly machine load forecast and summary inventory evaluation reports.

IBM Data Processing systems may be purchased or leased. To get the facts, call your local IBM representative.

Experience *— the added alloy in* ***Allegheny Stainless***



looking for thin walls in big diameters?

A-L now offers a wide range of stainless seamless tubing with walls as thin as .013".

From what other source would you expect to get stainless seamless tubing of 3½" OD with walls as thin as .058" and in the widest range of materials anywhere to fit a broad range of requirements in new products and processes?

Allegheny Stainless Tubing ranges for 3/16" OD to 3½" OD with wall thickness from .013" to .375". Typical of the specials A-L can make are 2½" OD—.032" wall thickness, 3" OD—.042" wall thickness and 3½" OD—.058" wall thickness. All sizes with true circularity, no dents or handling marks.

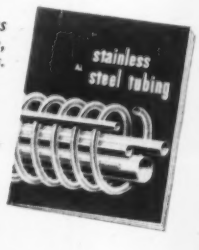
Stainless seamless tubing is made in all stainless grades including 309, 317, 318, 310, 416 and 446—normally difficult to obtain. For special high-temperature applications, A-L produces tubing in high-strength alloys such as A-286, and in vacuum melted steels and alloys. Also in custom analyses such as low cobalt (.01-.05) grades and with boron additions to standard grades.

A-L also makes composite tubes with bonded combinations of carbon and stainless steels and other metals for unusual corrosion applications in process equipment.

Allegheny Ludlum Tubing is available in small orders in random or cut lengths. Standard grades in stock throughout the country.

Write for your copy of Allegheny Ludlum Stainless Tubing, or call your A-L representative for all the help you need. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa. Address Dept. S-161.***

NEW!
FREE—A-L's new book on stainless tubing. 32-pages of technical data, sizes, grades and suggested applications.



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EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT

CALENDAR
OF MEETINGS

Apr. 27-29, Association of Iron & Steel Engineers: Spring conference, Statler-Hilton Hotel, Buffalo. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Apr. 27-29, Grinding Wheel Institute and Abrasive Grain Association: Semiannual meeting, Homestead Hotel, Hot Springs, Va. Information: Thomas Associates, 2130 Keith Bldg., Cleveland 15, Ohio. Business manager: W. B. Thomas.

Apr. 27-May 1, Metallurgical Society of AIME: International symposium on the physical chemistry of process metallurgy, Penn-Sheraton Hotel, Pittsburgh. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: R. W. Shearman.

Apr. 29-May 1, American Society of Mechanical Engineers: National metals engineering conference, Hotel Sheraton-Ten Eyck, Albany, N. Y. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

Apr. 30-May 1, National Association of Sheet Metal Distributors: Spring meeting, Pick-Roosevelt Hotel, Pittsburgh. Association's address: 1900 Arch St., Philadelphia 3, Pa. Executive secretary: Thomas A. Fernley Jr.

May 3-6, Air Conditioning & Refrigeration Institute: Annual meeting, Homestead Hotel, Hot Springs, Va. Institute's address: 1346 Connecticut Ave. N.W., Washington, D. C. Managing director: George S. Jones Jr.

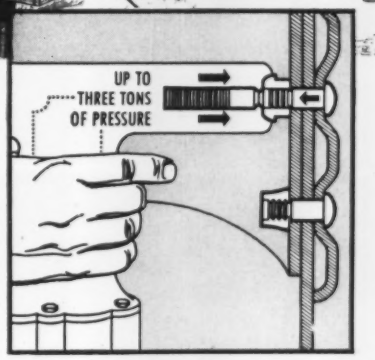
May 3-6, American Steel Warehouse Association: Annual meeting, Drake Hotel, Chicago. Association's address: 540 Terminal Tower, Cleveland 13, Ohio. Executive vice president and secretary: Robert G. Welch.

May 3-6, Liquefied Petroleum Gas Association Inc.: Annual meeting and exhibit, Conrad Hilton Hotel, Chicago. Association's address: 11 S. LaSalle St., Chicago 3, Ill. Secretary: Arthur C. Kreutzer.

May 3-7, Electrochemical Society Inc.: Spring meeting, Sheraton Hotel, Philadelphia. Society's address: 1860 Broadway, New York 23, N. Y. Executive secretary: Robert K. Shannon.

May 4-6, Rail Steel Bar Association: Annual meeting, Grove Park Inn, Asheville, N. C. Association's address: 38 S. Dearborn St., Chicago 3, Ill. Secretary: W. H. Jacobs.

May 6-8, American Management Association: Insurance conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. Insurance division's manager: E. Garrett Bewkes Jr.



Wayne takes the "Wiggle" out of Bus Bodies with Townsend Lockbolts

The world's foremost manufacturer of bus bodies—Wayne Works Division, Divco-Wayne Corporation—stresses strength, safety, and durability in construction.

Elimination of "rivet-wiggle" is one big reason why Wayne bus bodies are stronger. "Rivet-wiggle" and structural weakness occur when rivets fail to draw sheets completely together. Townsend lockbolts* have two qualities that enable Wayne to produce "wiggle-free" bus bodies.

First, these lockbolts produce absolutely uniform draw-down, or clinch, at each fastening because they are applied with an automatic gun that eliminates the element of human production-line error. Second, Townsend lockbolts, designed to lock with up to three tons of evenly distributed pressure, are far stronger than ordinary bolts, rivets, or spot welds.

In addition to uniform high clinch and vibration resistance, Townsend lockbolts offer ease and economy of installation. These are some of the reasons why Wayne has standardized on Townsend lockbolts for all structural fastening.

If you want these advantages in a fastener, a Townsend representative will be glad to demonstrate lockbolts right at your desk. For full information or a demonstration, write to Townsend Company, P. O. Box 237-C, New Brighton, Pa.

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COMPANY • ESTABLISHED 1816
NEW BRIGHTON, PENNSYLVANIA
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*Licensed under Huck patents RE 22,792; 2,114,493; 2,527,307; 2,531,048; 2,531,049 and 2,754,703

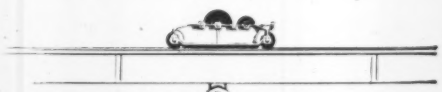
Morgan presents another FIRST...

DUAL CAPACITY HOIST (patent applied for)

Capable of performing the functions of two hoists, this new Morgan Dual Capacity Hoist combines either function in a single unit. Heavy loads are lifted at slow speeds, light loads at high speeds. One hoist drive does the work that previously required two completely separate drives.

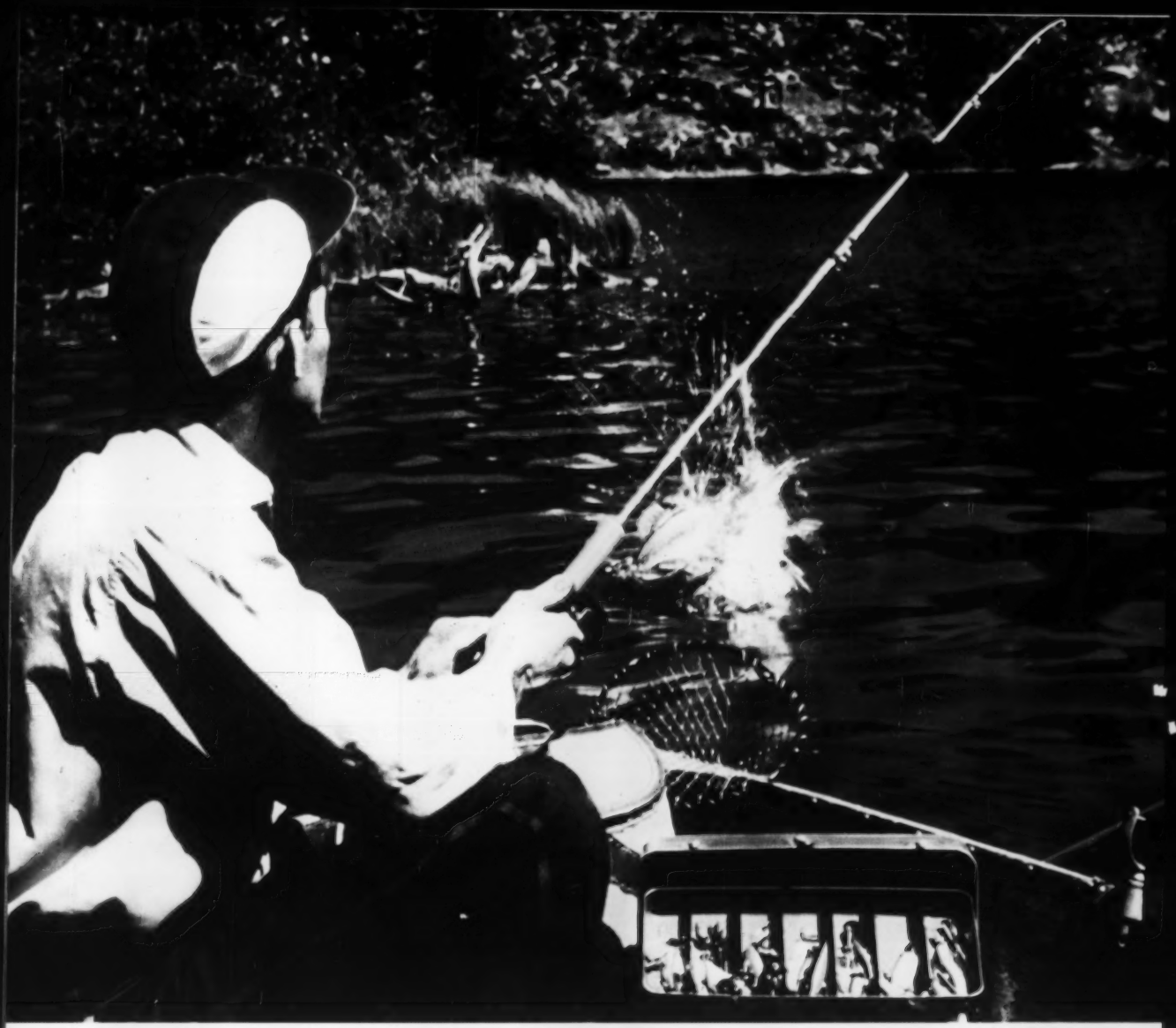
Morgan engineers developed the dual capacity hoist, by separating the hook block into two parts and altering the rope reeving through them. The shift from low to high speed hoisting is done quickly by mechanically separating the dual block and disengaging a portion of the reeving. On a given hoist, reeving can be modified to provide 2:1, 3:1 or 4:1 ratios.

Basically, the dual capacity hoist employs the same mechanism as a single hoist, thus allowing hook approaches and cost comparable to that of a single hoist trolley. Get in touch with Morgan and an experienced crane engineer will explain this system in detail.



THE **MORGAN** ENGINEERING CO. *Alliance, Ohio*

Overhead electric traveling cranes, gantry cranes, open hearth special cranes, blooming mills, structural mills, shears, saws, auxiliary equipment and welded fabrications.



Hidden skills help to keep 'em on the hook

What a tingle peppers your spine as three pounds of fury strike the lure! Rod, line, leader, and plug strain to hold the prize on the hook and bring him to net.

Behind this battle are the skills that made the hook itself. One of the leading makers of hooks is the Auburn Fishhook Company, Inc., Auburn, N. Y., who can assure you that it's a very finicky process. And take it from us: producing this kind of wire is an equally finicky job!

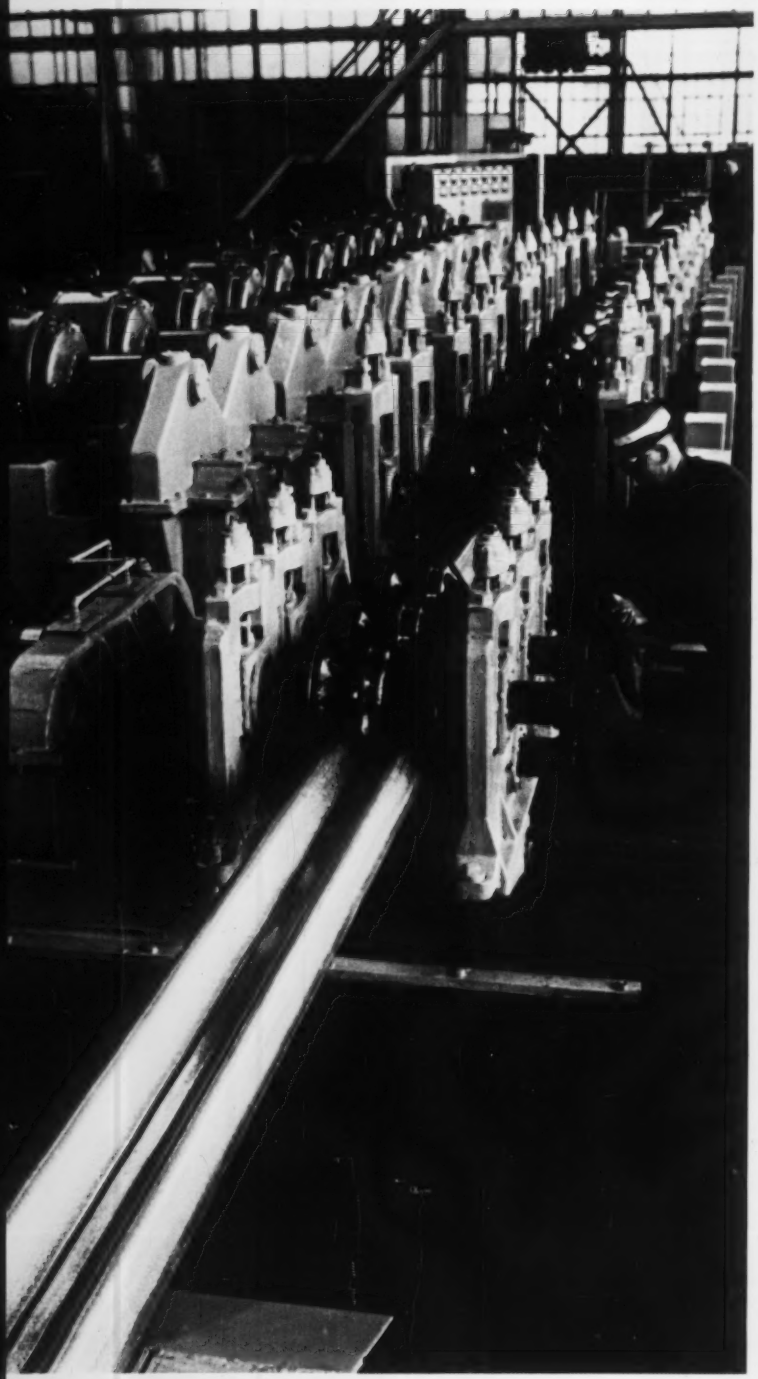
To begin with, the physical characteristics of the wire must be just about perfect so that the small eyelet and incredibly sharp barb and point will form without fracture. And the finished wire must be almost surgically clean so that no lubricant traces can gum up the hook-machine.

Bethlehem has produced fishhook wire in sizes as small as .035-in. diameter. In fact, if it's fine wire you are interested in, we can furnish it down to .007-in. diameter. There's a Bethlehem wire for just about every product, from bolts and nuts to coat hangers, upholstery springs, and can keys.

BETHLEHEM STEEL

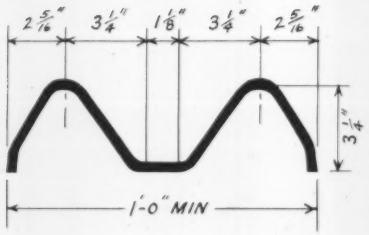
Bethlehem engineers will help you with your steel-working problems

This shape is cold-formed after continuous galvanizing



Here in our specialty products shop at Lackawanna, N. Y., we roll beam guard rail for highways, which is severely cold-formed after galvanizing. The raw material is 12 ga continuously-galvanized sheet. The roll train smoothly coaxes the strip into the section shown in the drawing, and does it without the slightest bit of damage to the protective coating of zinc!

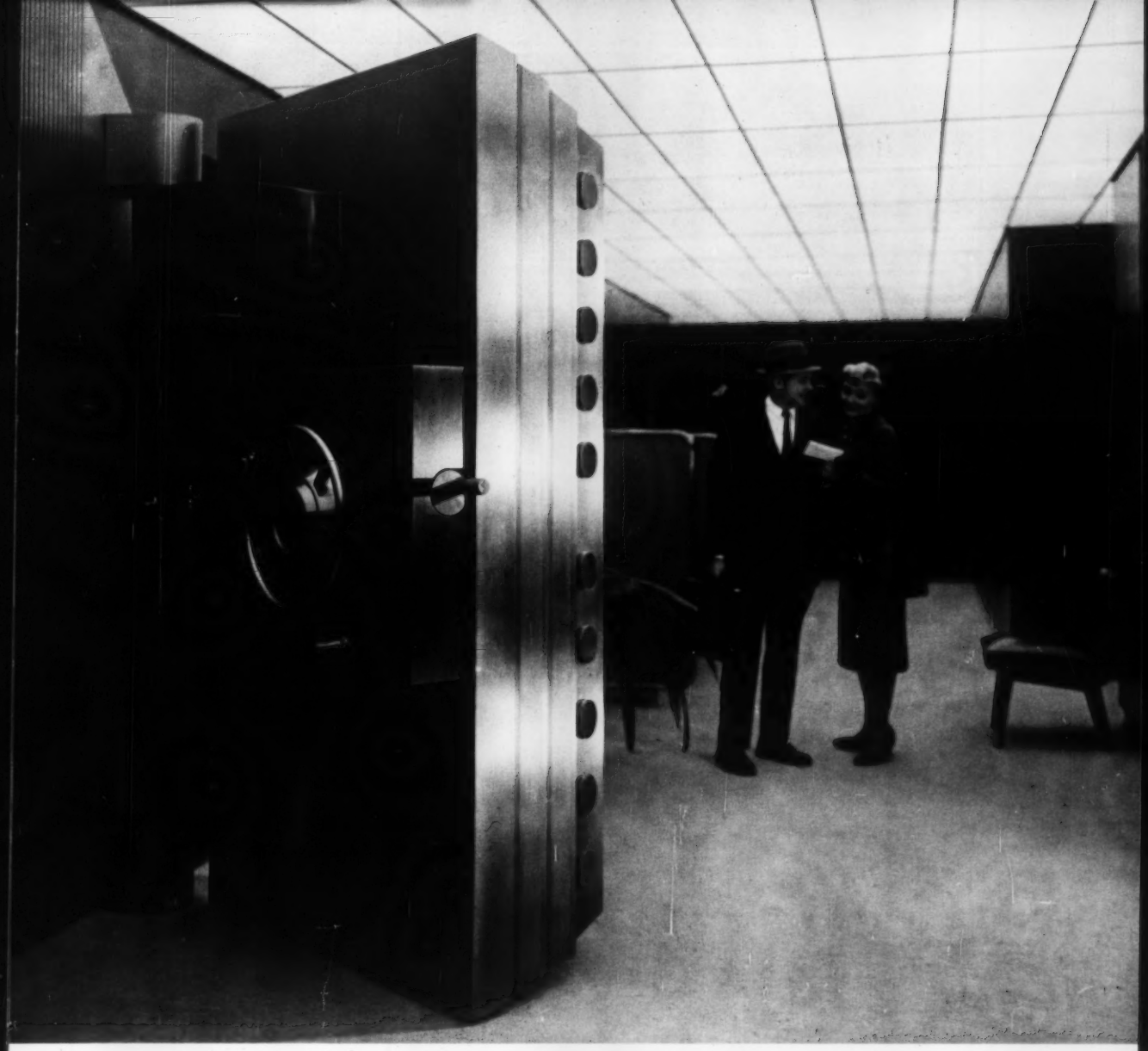
Bethlehem cold-formed shapes are uniform in thickness. They eliminate shop-time cutting and bending, end the scrap disposal problem. They have a high strength-to-weight ratio, and often permit the use of a lighter section in place of heavier hot-formed material. We turn out hundreds of shapes—on presses, brakes or rolls, in all gages from 5 to 24, in virtually any length.



BETHLEHEM STEEL

Cold-formed shapes–could they better your product?

A simple pencil sketch, with dimensions indicated, might very well open the door to a new cold-formed shape which you can put to advantageous use, either in an existing product, or as a part of one that's now in the thinking stage. If you have an idea which might be developed, please let us know about it. Send your sketch, plus pertinent information, to us at Bethlehem, Pa.



Your valuables are safe behind steel plate

Billions in jewels, securities, cash, and other valuables rest securely in thousands of bank vaults. The massive vault doors are made of heavy steel plate to resist fire, earthquake, and explosion.

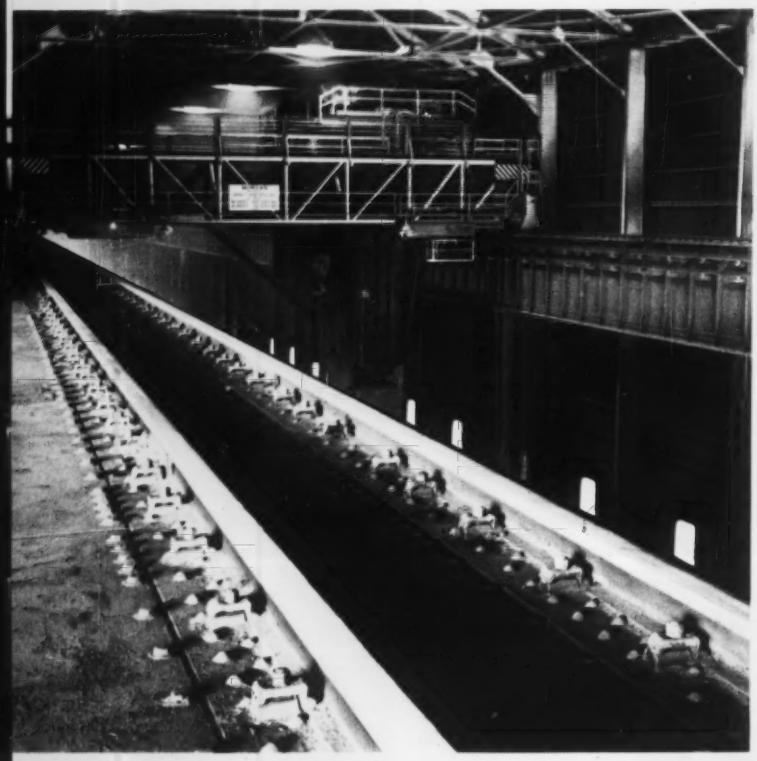
Here we see one such door at The Philadelphia National Bank. Bethlehem plates were used by The Mosler Safe Company in fabricating this 30-ton weldment. The Mosler people have found that the uniformly high-quality of Bethlehem plates, together with proper welding techniques, result in sound welds every time.

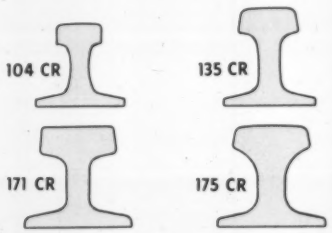
Bethlehem furnishes plates in full range of sheared and universal mill sizes. Full information from our nearest sales office. Or write us at Bethlehem, Pa.

Bethlehem engineers will help you with your steel-working problems

BETHLEHEM STEEL

Four rugged rails for overhead cranes





Runway rails take a real beating as heavy overhead cranes roll back and forth, day after day, year after year. That's why crane rails are usually heavier and more rugged than ordinary railroad rails.

Bethlehem, a leader in the manufacture of rails of all kinds, produces four sections developed especially for crane service. Over the years they have given long, dependable service in a wide range of applications. For still longer life, we can furnish them heat-treated.

If you are having crane runway problems right now, or you plan to install a new runway, a Bethlehem engineer can help you. Or, you might wish to have our Catalog 464, "Bethlehem Crane Rails."

For either one—catalog or engineering assistance—just use the coupon.

Bethlehem Steels and Specialties

Here is a partial list of steels and specialty products in the Bethlehem line:

BARS AND BILLETS:
Carbon and alloy AISI grades
Concrete reinforcing bars
Leaded carbon and alloy steels
Special rolled sections

TOOL STEELS:
A grade for every job

FORGINGS: Drop, press, hammer, and upsetter
Rolled-and-forged special sections

SHEETS: Hot- and cold-rolled
Continuously galvanized

TIN MILL PRODUCTS: Electrolytic and hot-dip tin plate; black plate

PLATES: Universal and sheared

ROD AND WIRE: General and special-purpose types
Fine and shaped wire

WIRE ROPE AND SLINGS

FASTENERS: Standard bolts, cap screws, rivets
Special fasteners

STEEL PIPE:
Continuous buttweld
Electric resistance-weld

STRUCTURAL SHAPES

COLD-FORMED SHAPES

PALLET RACKS

WELDMENTS: Frames, tanks, housings, vessels

RAILS: Tee, crane, girder

CASTINGS: Carbon, alloy, and stainless steel
Grey iron; brass and bronze

PUBLICATIONS DEPARTMENT M6
BETHLEHEM STEEL CO., BETHLEHEM, PA.

Gentlemen: I would like additional information on

_____

Name _____

Address _____

City and State _____

Folder 685 594, Printed in U.S.A.

Bethlehem Steel Company, Bethlehem, Pa.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

BRIEFS

on a handy booklet for anyone who buys caustic soda... how to keep arsine out of pickling baths... how to cut degreasing costs... a chemical for electroless nickel plating

Caustic Soda Buyer's Guide offers fast facts

Quick answers to questions on caustic soda abound in this pocket-sized booklet.

You'll find in it basic information on forms and grades, containers and shipping methods.

One section deals with the comparative economics of 50% and 73% liquids solutions. It includes a table and nomograph to help you decide which concentration is the *better* buy for *you*.

Another nomograph helps you estimate instantly how much caustic of a given strength you need to get a given volume of your process solution.

We've also pointed out some factors you might consider when choosing a supplier.

Just clip the coupon for a copy.

How to help keep arsine out of pickling baths

If there is any arsenic in the muriatic acid you use for pickling, it can combine with free hydrogen to form arsine, a dangerous compound to have around.

Arsenic can also be reduced to the metal, leaving spots on the articles you pickle.

All this makes us happy that there is not a bit of arsenic in either of the grades of muriatic acid we sell. In fact, the level of all impurities is quite low. Sulfates check in at a low 0.003% in both our Commercial Grade and Hooker White Grade. There's less than 0.0005% iron in Commercial, less than 0.0001% in Hooker White.

We ship both grades in 18°, 20°, and 22° Baumé solutions in rubber-lined tank cars. Literature will be sent upon coupon request.

Are your degreasing costs too high?

If they are, one reason may be that you have to constantly add new stabilizers to the trichlorethylene you use.

If you are one of those who have to titrate baths frequently and then freshen them up, you may be surprised to learn that there is a trichlor you never have to add stabilizer to—NIALK® TRICHLOR.

NIALK, and only NIALK, has *psp* —permanent STAYING power—in its neutral stabilizer. This stabilizer just does not wear out during normal use. Even after repeated distillation, it's still active, still protecting your trichlorethylene against heat, light, air, moisture, acids, and active metals.

If you'd like to know more about this stable trichlorethylene, send us the coupon.

Electroless nickel plating with $NaH_2PO_2 \cdot H_2O$

There's been a lot of activity of late in the electroless nickel plating of metallic and plastic objects by co-deposition of metals and metallic phosphides.

This probably explains the increased business we're enjoying with our sodium hypophosphite, commercial grade.

Our free-flowing, white, odorless crystals are available in 100- and 325-lb. fiber drums.

Our technical data sheet is offered in the coupon.

For more information on the chemicals mentioned on this page, check here:

- ☐ Caustic Soda
- ☐ Muriatic Acid
- ☐ Trichlorethylene
- ☐ Sodium Hypophosphite

Keep your file current with data on these other Hooker chemicals:

- ☐ Virgo® Descaling Salt
- ☐ Virgo Electrolytic Salt
- ☐ Virgo Molten Cleaner
- ☐ Oxalic Acid

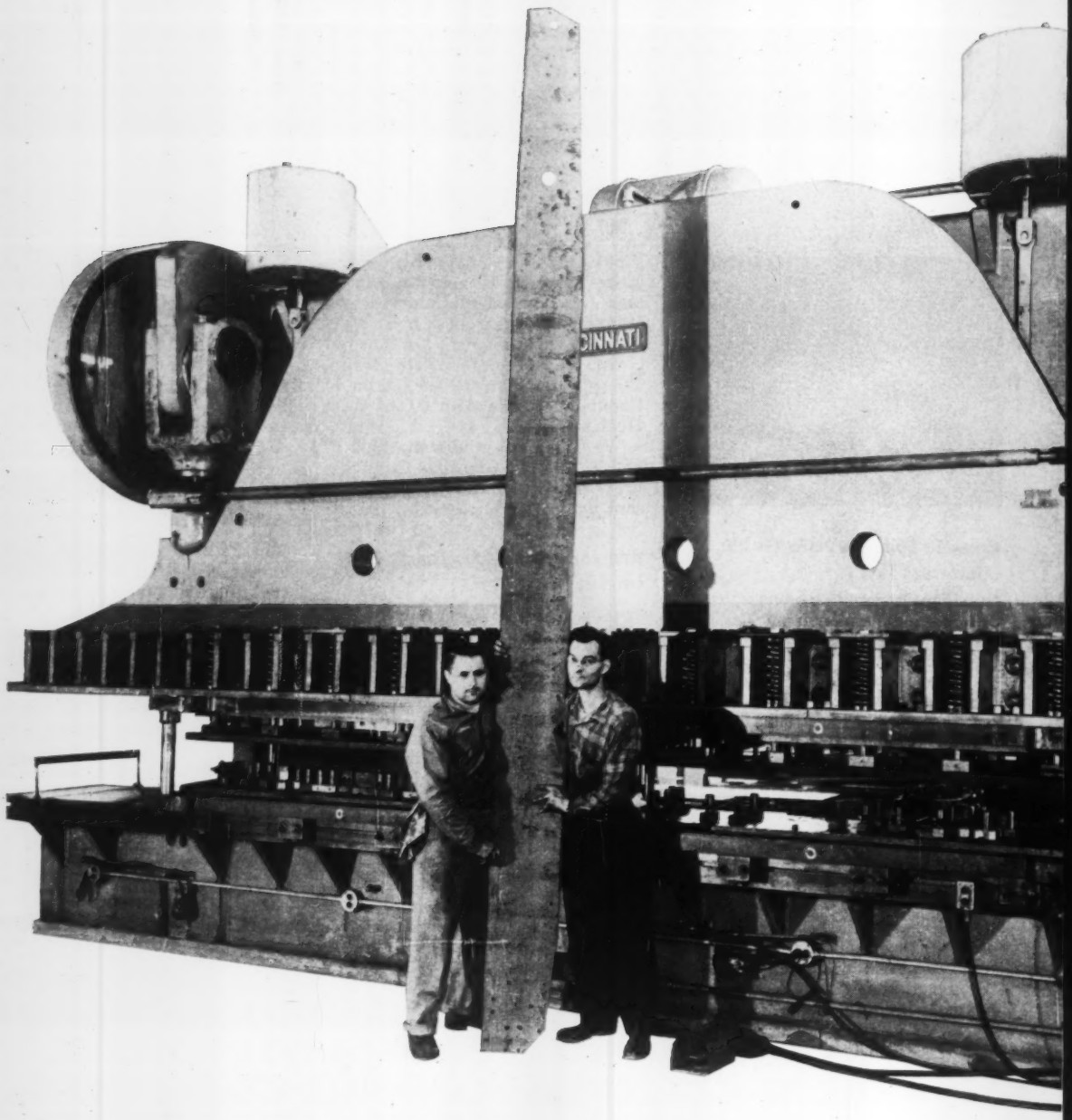
Clip and mail to us with your name, title, and company address. *(When requesting samples, please use business letterhead.)*

HOOKER CHEMICAL CORPORATION
1204 UNION STREET, NIAGARA FALLS, N. Y.

Sales Offices: Chicago Detroit Los Angeles New York Niagara Falls Philadelphia Tacoma Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B. C.

HOOKER CHEMICALS PLASTICS

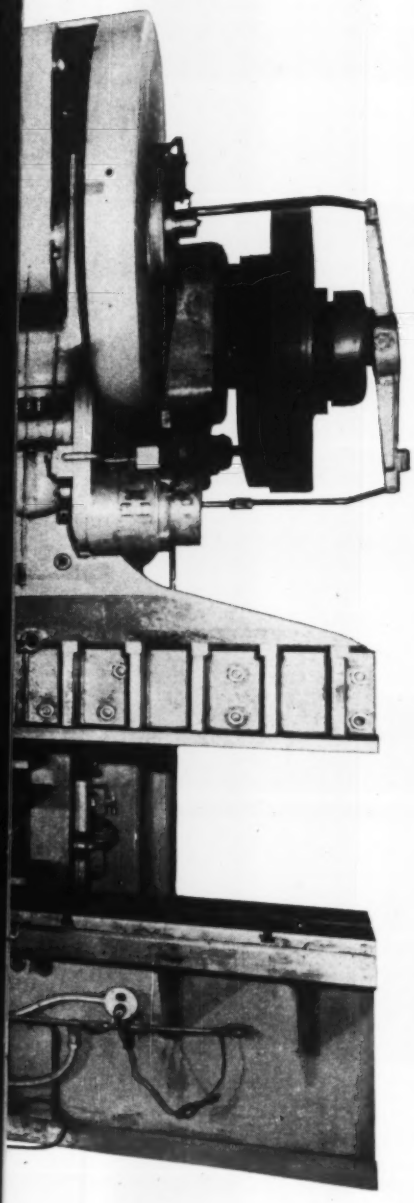
70 minutes

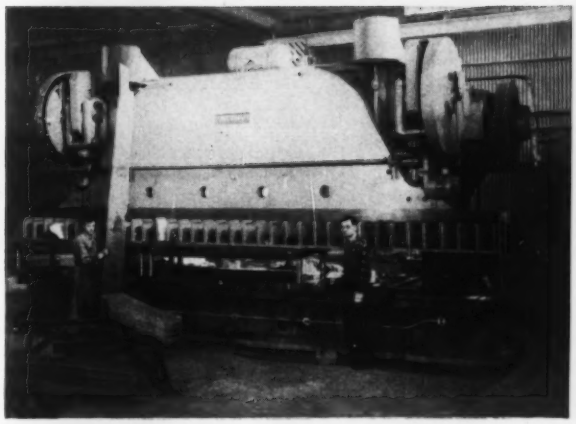


Punching floor-to-floor time cut from 36 to 1⅓ minutes.

Photos courtesy Fort Wayne Structural Steel Co., Inc.

cut to 2.6 min.





Blanking floor-to-floor time cut from 34 to 1¼ minutes.

In combined blanking and punching operations, production time has been cut 96.2% on these long truck side rail reinforcements, thanks to the versatility of this Cincinnati® All-Steel Press Brake.

Operating data, furnished by John L. Hayner, President Fort Wayne Structural Steel Co., Inc., show how his company substantially slashed production costs.

They decreased floor-to-floor time from 34 minutes to 1¼ minutes on blanking ¼" C1010 Steel with a 202" cutting edge. By punching 130 holes per stroke, floor-to-floor time reduced from 36 minutes to 1⅓ minutes.

Talk with our Application Engineering Department about applying a time-cutting Cincinnati Press Brake in your shop. It can be the most profitable decision you've made this year. Write Department C for Press Brake Catalog.

Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

Cincinnati 11, Ohio, U.S.A.

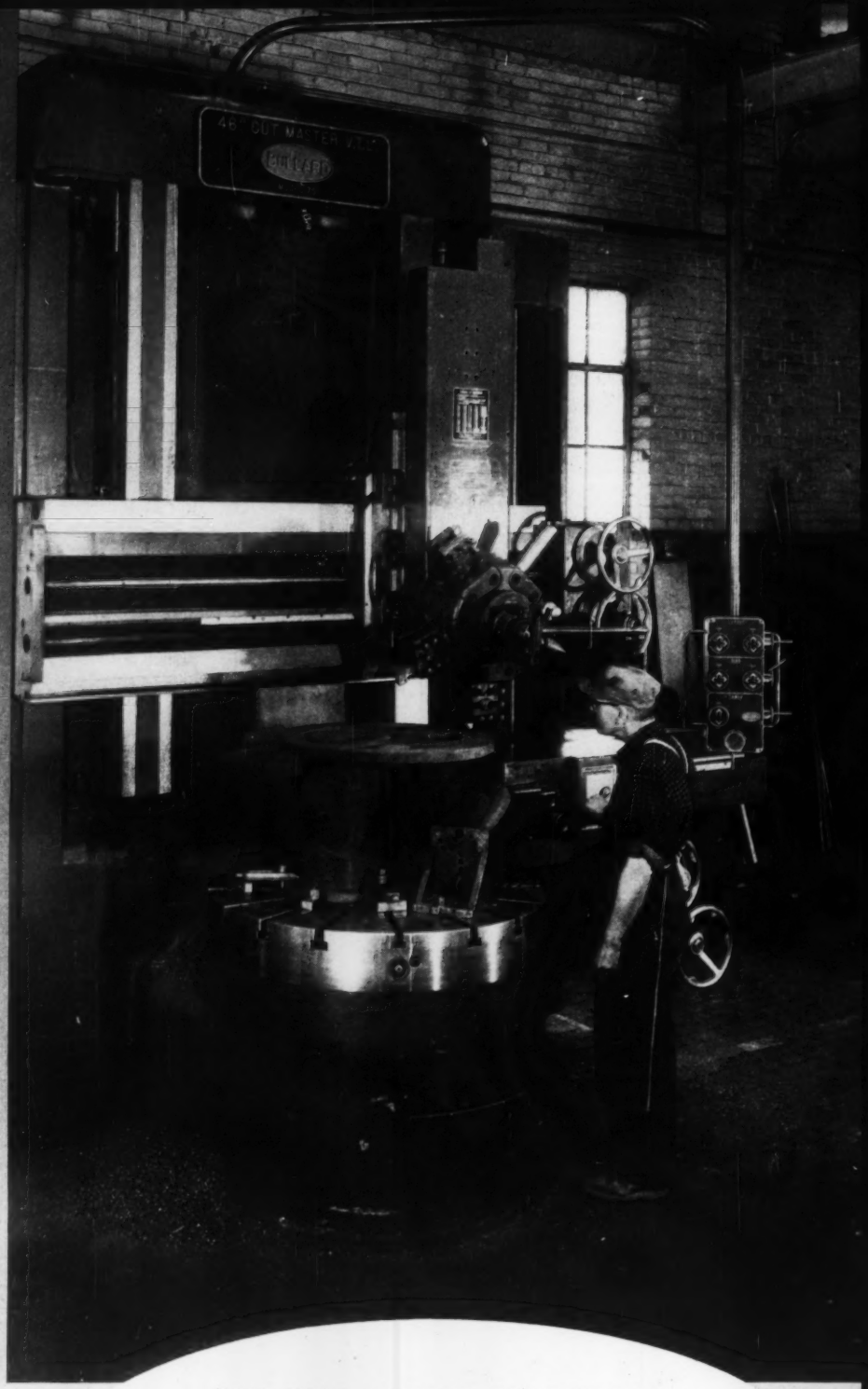
"We are WELL SATISFIED with our

BULLARD

Cut Master V.T.L., Model 75

Extreme accuracy is mandatory for a number of machining jobs at the Fuller Company, Manheim, Pa. For example, according to Mr. M. L. Strayer, Machine Shop Supt. "the largest volume piece we process on our Cut Master, Model 75, is the facing of seats for cement diverting valves. They must be perfectly flat. This critical operation is done so accurately on the Bullard Cut Master, Model 75, that with a little hand lapping we have an airtight joint."

This machine has a 24" extra high bed, speed range 6.8 to 250.0 R.P.M. Equipped with 5 sided Turret Head and 4 sided Side Head, both hand indexing, 4 jaw hand operated chuck.

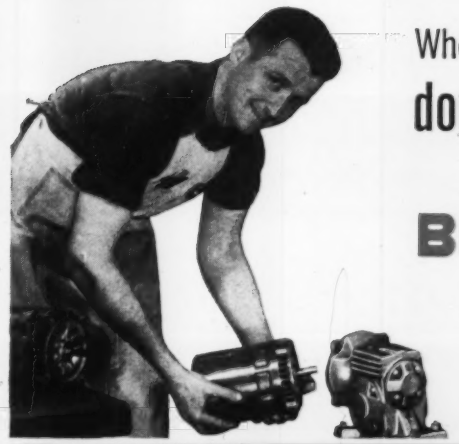


This "built-in" accuracy, which is inherent in every Bullard Cut Master V.T.L., Model 75, can be applied to your work.

CALL YOUR BULLARD SALES OFFICE
OR DISTRIBUTOR FOR THE COMPLETE STORY

THE BULLARD COMPANY

BRIDGEPORT 9,
CONNECTICUT



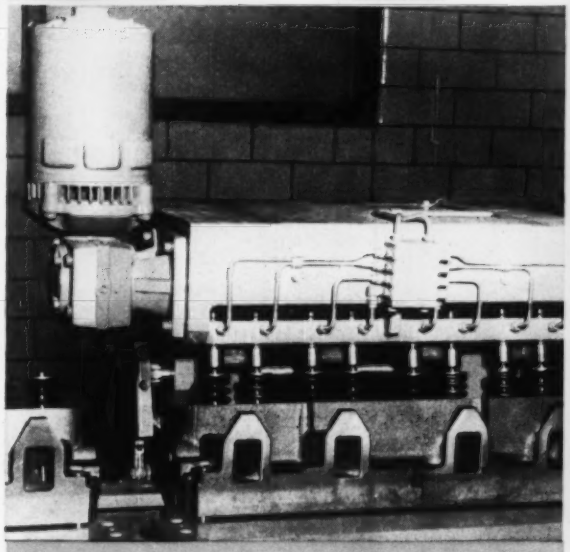
Where continuous automatic operations demand

double insurance against downtime

the leading choice is standardized

BOSTON Gear® SPEED REDUCERS

NO DOWNTIME for motor repairs. The standard end-mounted motor on BOSTON Gear RATIOMOTORS is easily detached by removing the bolts holding the motor to the gear unit flange. A spare motor can be attached, and operations resumed in a *few minutes*. Gear unit remains undisturbed, preserving alignment.



BOSTON Gear Vertical Right Angle RATIOMOTOR drives the valve "popping" (final test) unit in a giant 29-station transfer machine for continuous automatic assembly of cylinder heads.

BOSTON Gear Horizontal Right Angle RATIOMOTORS drive magnetic belts which convey parts from lower storage bins to vibratory hoppers at start of 13-station, automatic assembly of roller skate wheels.

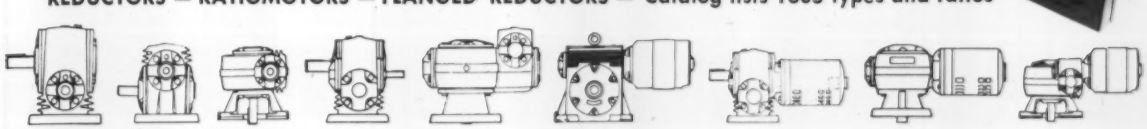
BOSTON Gear RATIOMOTORS are the leading choice for all types of installations where downtime would be disastrous to production schedules. One reason is BOSTON Gear quality standards, which assure highest efficiency and extra service life of the gear unit. Another is BOSTON Gear design leadership like the detachable motor which permits continued operation with a spare, avoids downtime. Design around BOSTON Gear RATIOMOTORS for this *double* insurance against downtime. All types and ratios are *standardized stock* models, quickly available anywhere from over 100 BOSTON Gear Distributors. Boston Gear Works, 73 Hayward Street, Quincy 71, Massachusetts.

Advt. copyright by Boston Gear Works

From Stock!
AT YOUR NEARBY BOSTON Gear DISTRIBUTOR

— STANDARDIZATION PAYS —

REDUCTORS — RATIOMOTORS — FLANGED REDUCTORS — Catalog lists 1605 types and ratios



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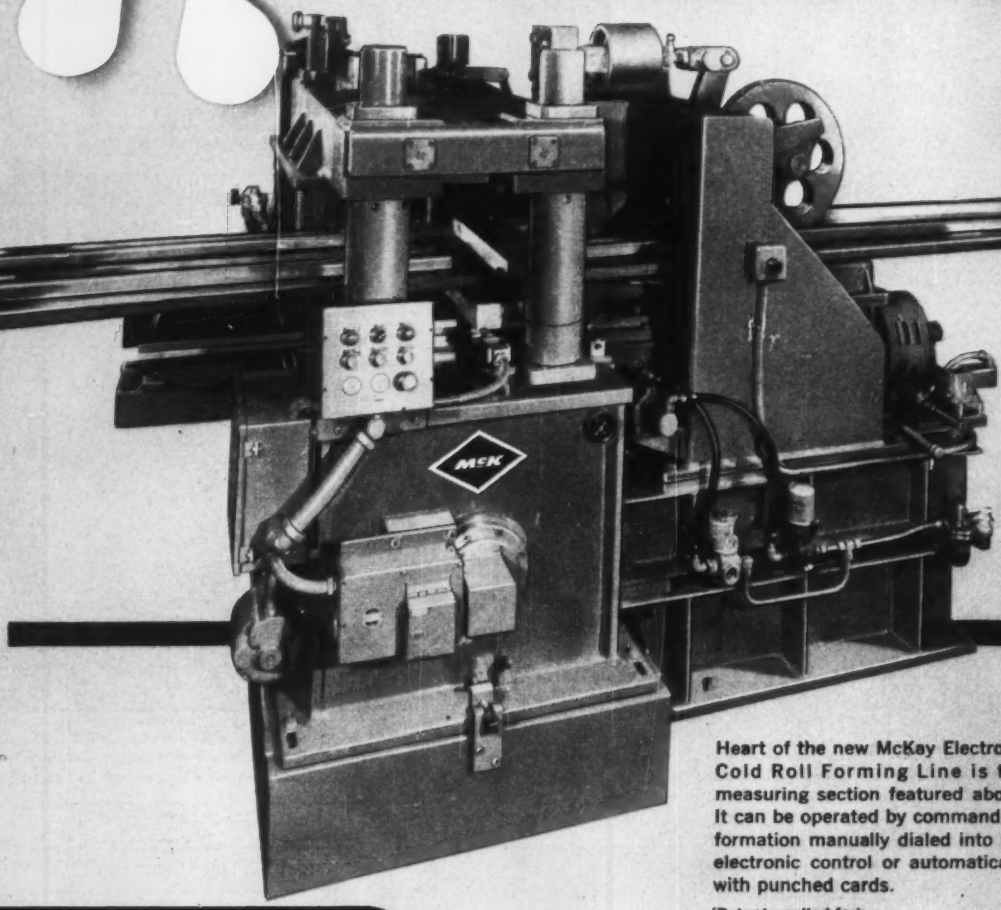
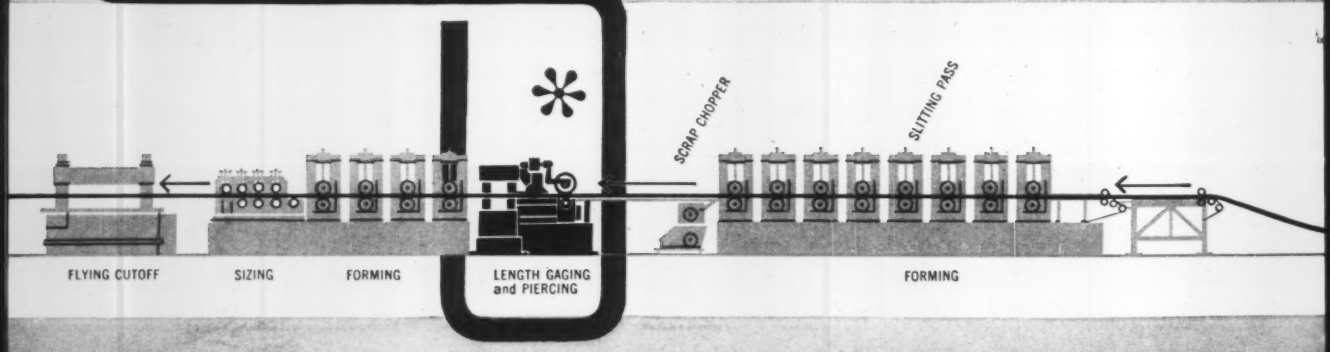


Heart of the new McKay Electronic Cold Roll Forming Line is the measuring section featured above. It can be operated by command information manually dialed into the electronic control or automatically with punched cards.

(Patent applied for)



The line illustrated above was recently purchased by a large building products manufacturer for high speed production of roof and floor deck.

different lengths...

...WITHOUT A MANUAL ADJUSTMENT

McKAY'S ELECTRONIC LENGTH GAGE has a memory permitting instantaneous changes in cut lengths and scheduled quantities as well as precise control of notch and punch spacing on each length.

A transistorized electronic control reads and stores information from punched cards and utilizes an electronic counter to trigger a punching and notching press at precise intervals as commanded by the coded data on the punched cards.

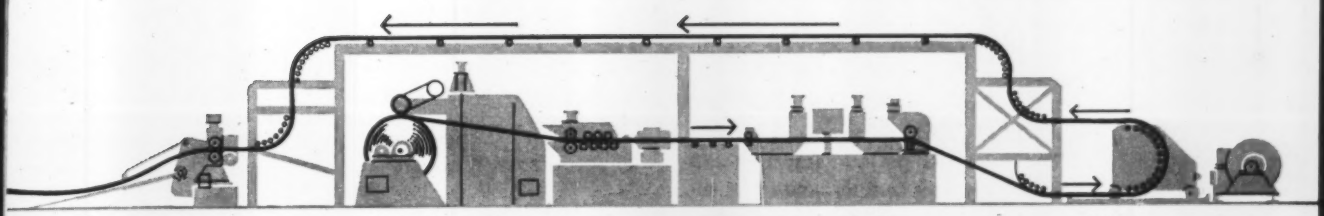
Now! the planning department can schedule the output of a forming or cut-up line without waiting to group identical lengths.

Now! down time previously required for manual length gage adjustment is converted to productive time.

Now! in addition to length control, precise spacing of notches and punches can be controlled and changed by commands received from coded information on the standard data processing card.

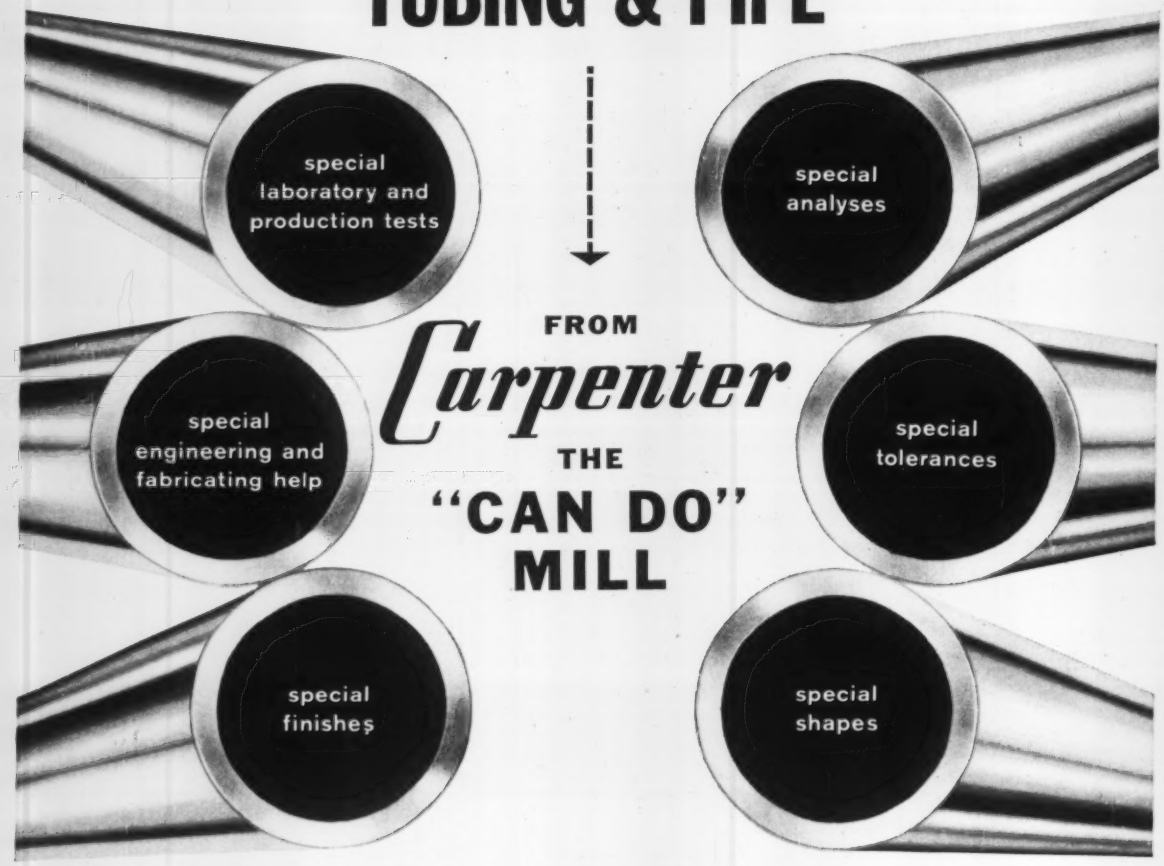
BE SURE TO GET THE FULL STORY ON McKAY'S ELECTRONIC GAGE FOR YOUR PRODUCTION LINES.

Call or write the McKay Machine Company, Youngstown 10, Ohio.



McKAY MACHINE

Where to get your "special needs" of Stainless and High Alloy TUBING & PIPE



Anytime you come up against *unusual* needs for stainless or high alloy tubing and pipe . . . anytime you are faced with hard-to-solve problems of corrosion, temperature conditions, fabrication, installation and design-engineering . . . it's time for you to consult with Carpenter. Save yourself time, worry and money by putting your "special needs" in our competent and experienced hands. Carpenter facilities and technical staff are geared to give you specialty services not available from other sources. Supplying plant engineers, equipment builders and product designers with the tubing, pipe and "know-how" to satisfy out-of-the-ordinary needs is a 32-year-old story with the Carpenter Alloy Tube Division. Whether your future needs are special or just ordinary, call in your Carpenter representative or contact The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

your master key to cost-saving corrosion control

Carpenter

Stainless & High Alloy Tubing & Pipe

FOR EVERY APPLICATION, THERE'S ONE CRANE OUTSTANDING...

IN METALWORKING: Huge industrial cranes with P&H Electronic "Stepless" Control are used to handle the largest metalworking shop loads with ultra-fast speed, yet with damage-eliminating gentleness. Where duty cycles permit, smaller, moderately priced P&H cranes handle a host of lifting jobs with plenty of muscle, but low investment.

All the mechanical and electrical parts for both big and small P&H cranes are made by and warranted by P&H. We promise undivided responsibility — not a service "run-around". When we sell it, we service it — and our interest in your crane stays active as long as it is on your runway!

Isn't that the assurance you want on your next crane? Bulletin C-6, "P&H Industrial Cranes," is packed with photos and facts showing how P&H installations service *your* industry. Write Dept. 102, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

OUR 75TH YEAR

P&H HARNISCHFEGER

...quality and service for 75 years

WHEN PRECISION PRODUCTION RIDES THE HOOK...

On a crankshaft production line, even slight damage to a crankpin can mean an expensive piece of scrap — something no manufacturer can afford.

That's why this manufacturer uses *close-spotting* P&H Zip-Lifts.

Where every movement is made with hoists, a hoist breakdown means lost production — something no manufacturer wants.

That's why this manufacturer uses *dependable* P&H Zip-Lifts.

And human beings need protection — against electric shock, mechanical failure, poor construction, and other hazards.

That's why this manufacturer uses *safe* P&H Zip-Lifts.

Are *you* now using close-spotting, dependable, safe P&H Zip-Lifts — or are you one of the group of hoist users who is about to switch over to them? Capacities from 250 to 2000 lbs., your choice of mountings. Priced from $200. Write for Bulletin H-20, Dept. 201, Harnischfeger Corp., Milwaukee 46, Wisconsin.

P&H HARNISCHFEGER

...quality and service for 75 years

OUR 75TH YEAR

"TOUGH NUTS?...We Put Ours on NATIONAL Cold Nut Formers!"

These Unusual Nuts Are Being Made from Various Materials (Including High-Carbon) on National Cold Nut Formers.

The slogan, "We Put Our Tough Ones on Nationals," is not one we dreamed up.

It sprang up in the trade, among the highly-skilled and well-equipped Nut manufacturers who have been meeting competently your "impossible" demands and your normal needs.

Have you looked into the design variations and high quality attainable these days by users of National Cold Nut Formers? If you make Nuts, or other cold-formed parts (or parts which should be cold-formed) have you considered widening your range and type of work? By offering the most modern, productive and profitable Cold Nut Formers available, we can help you meet quickly the growing demands of metalworking.

Tool design? Our working development engineers – contributing daily to the science of Metal Flow – are at your service.

Let us work with you.

National ½" Cold Nut Former. Available in sizes ¼" to 1".

Founded 1874 — DESIGNERS and BUILDERS of MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS CO-PIONEERS WITH INDUSTRY OF ADVANCED METALWORKING PRODUCTION METHODS

NATIONAL MACHINERY CO.

TIFFIN, OHIO, U. S. A.

HARTFORD DETROIT CHICAGO

General Electric can help you...

MODERNIZE FOR PROFITS ...through automation

GENERAL ELECTRIC'S "RING OF THE FUTURE" CONCEPT

*Copyright 1958, General Electric Company

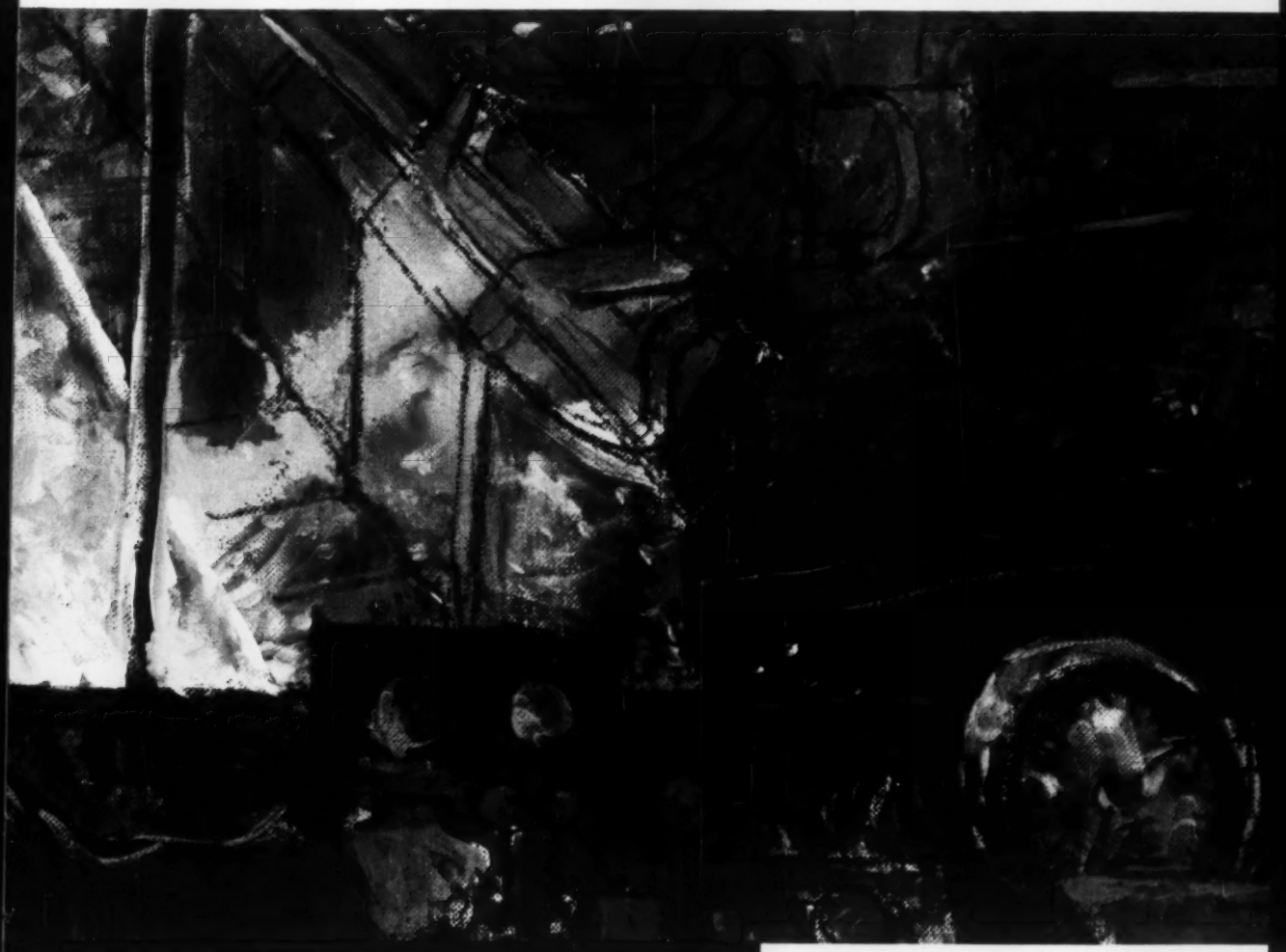
"THE RING OF THE FUTURE"...

... General Electric's approach to automation, helps you blend the products of today into the systems of tomorrow . . . provides a logical, step-by-step approach to modernization through automation. Start your program now. Call your General Electric Apparatus Sales Office for complete information about the "Ring of the Future" and how it can be applied to:

- **REVERSING HOT MILL PROCESSES**
- **HOT STRIP MILL PROCESSES**
- **CONTINUOUS MILL PROCESSES**
- **PROCESS LINE OPERATIONS**

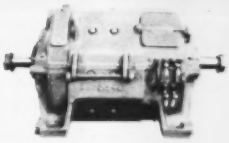
You can meet your competitive challenge decisively with a planned program of modernization . . . modernization that provides greater machine flexibility, higher efficiency and output from your metal rolling and processing systems. General Electric stands ready to assist you in blending the products of today into the systems of tomorrow. To learn more about modernization through automation, mail the coupon below for General Electric's "Ring of the Future"* kit.

For a 13" x 29" lithograph copy of this painting suitable for framing, write on your letterhead to address below.

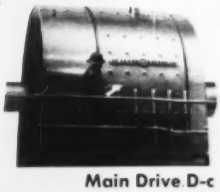


CAN HELP YOU MODERNIZE FOR PROFITS

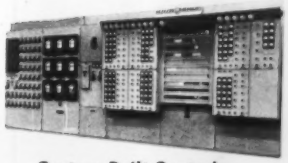
Computers



MD-600 Armored Motors



Main Drive D-c Motors



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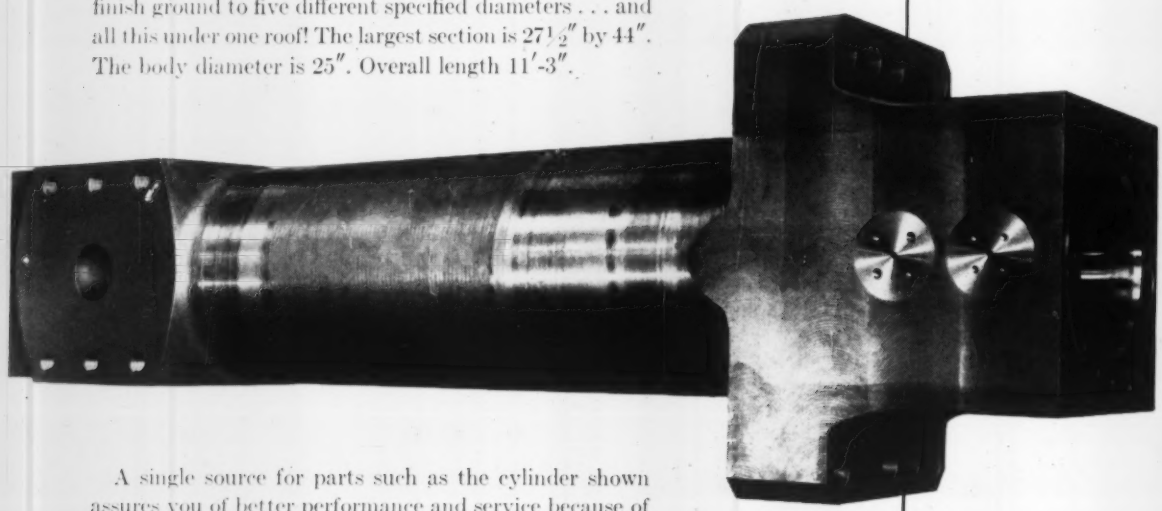
This is a side cylinder for a hydraulic press. It was made from a Finkl C 1035 electric furnace steel forging weighing 32,000 pounds. When shipped it weighed 14,850 pounds. Between the start and finish it had been heat treated, milled, turned, tapped, and the inside bored and finish ground to five different specified diameters . . . and all this under one roof! The largest section is $27\frac{1}{2}$" by 44". The body diameter is 25". Overall length 11'-3".



A single source for parts such as the cylinder shown assures you of better performance and service because of greater quality control through each step of its processing.

"Forgings by Finkl" is synonymous with highest quality. Finkl custom forgings have the stamina and fatigue resistance to withstand the severe strains and torsional stresses encountered in modern heavy duty machinery. We also produce repair parts for all types of forging equipment; containers, liners, and plungers for extrusion presses; plastic molds; and die casting steels.

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Roebling Wire in convenient bulk packaged to make your products easier

If you use high-carbon wire in sizes from .060" diam. to .030" diam., it will pay you to investigate Roebling's Reel-less Core Packaging System. This method offers you substantial savings in several ways—to say nothing of the quality wire that Roebling always delivers in any kind of package.

Here's how simple it is:

Cores are palletized two cores per pallet and can be stacked two or three pallets high (think of the saving in storage space).

Empty reels are not accumulated because there are no reels to store, send back, bookkeep, get credit on, or pay shipping charges on (either way). Just unwrap the wire, set it up the way you see here, and there you are. Where a limited number of reel-less core packages are used, or where wire is flipped from reels mounted in a horizontal position, the tilt table is not necessary.

This method is typical, indeed, of Roebling's efforts to make quality easier to handle and to banish the problems that cost you time, money and sharp pains across the brow.

Full details of wire without reels will be immediately forthcoming when you write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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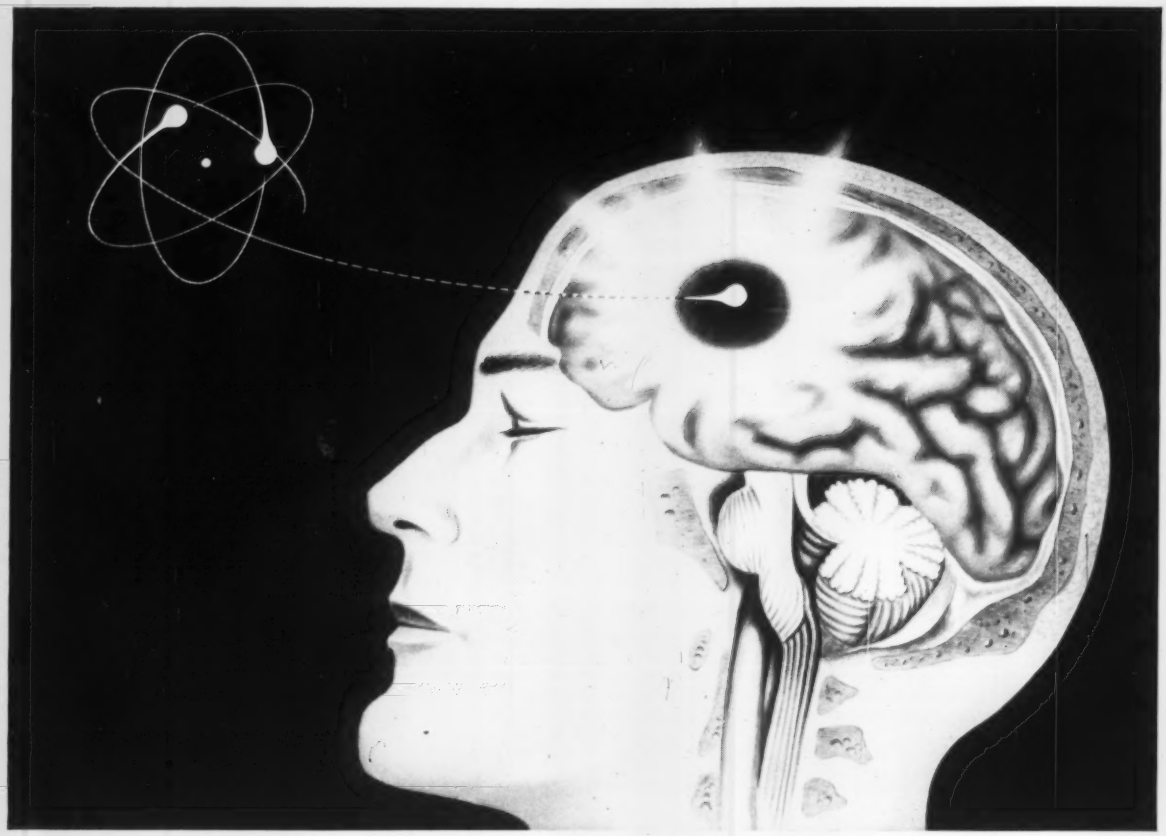

Neutron-sensitive isotope made in Monel fractionator

Boron-10 vs. brain tumors

Physicians and scientists working in cancer research at Brookhaven National Laboratory, Upton, N. Y., are probing the use of Boron-10 isotope in treating a common type of brain tumor *(glioblastoma multiforme)*.

Results of this therapy are so encouraging that Brookhaven and at least two other institutions are constructing additional nuclear reactors used in this therapeutic venture.

The method. In a technique known as Neutron Capture Therapy, the patient receives an injection of a Boron-10 compound. Cancerous tissue absorbs Boron-10 more rapidly than healthy tissue. While the isotope is concentrated in the tumor, neutrons from a nuclear reactor are beamed at it. The Boron-10 in the cancer absorbs most of the neutrons.

In the split second that the Boron-10 becomes radioactive, it produces short-ranged alpha particles which destroy cancerous tissue with a minimum of damage to healthy tissue.

Producing the isotope. The plant furnishing Boron-10 to Brookhaven ordinarily turns out about three pounds during a 24-hour work day. Separation of the isotope takes place in what is described as "the world's most efficient fractionating system." In 350 feet of total height, six series-connected Monel* nickel-copper alloy columns enrich a complex containing 18.8% Boron-10 isotope to one containing 92% Boron-10.

Corrosive action foiled. Throughout subsequent manufacturing processes, where equipment is constantly subject to fluoride attack, only pure Nickel or Monel alloy is used. These metals hold corrosion at arm's length in columns, reboilers, condensers, vessels, pumps, and piping.

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McDonald, Cooper Jockey for Positions

Veteran labor observers are guessing that the steelworkers will settle for a package costing somewhere between 6 and 11 cents per manhour. That would likely mean a 4 to 6 cent wage boost plus improved pensions, insurance, and vacations. But that compromise won't be reached without a lot of talk and probably a strike (Page 53). Most of the discussion will center on how to measure productivity and the effects of a wage boost on America's ability to compete for world markets.

And Mr. McDonald Wants This Position Too

The USW is waging a campaign to seat David McDonald on the board of directors of Crane Co., Chicago maker of plumbing wares. A USW local is trying to spotlight a union belief that Crane plans to close its main Chicago plant. The local is soliciting proxies for Mr. McDonald's election at tomorrow's annual meeting.

Ways to Invade Capital Goods Markets

1. A do-it-yourselfer made what he couldn't buy and developed a market. 2. Another had used a homemade roller gear drive for years; he investigated the market and now sells the drive plus auxiliary equipment. 3. One firm set up a small job shop and watched for licensing possibilities. 4. An Ohio firm got 200 inquiries from a convention exhibit. Are you overlooking markets? (Page 58).

Inland's Smith Points Up Import Problems

"A Peoria, Ill., housebuilder can buy a keg of Belgian nails for $1 less than he would pay a local mill. An Illinois farmer can purchase a ton of imported barbed wire for $40 less than the American product." John F. Smith Jr., president, Inland Steel Co., uses those examples to point up the problem midwestern steel mills will face when the St. Lawrence Seaway opens next month. He expects an influx of foreign steel since "some European and Japanese steels sell at prices below our manufacturing costs." He places

the blame on the huge wage differential between U. S. and foreign workers. Last year's finished steel imports cost American steelworkers $97 million in wages and benefits, he reports.

Lost in a Decade: Market for 53,483 Tons of Fence

U. S. EXPORTS

	NET TONS
1949	16,318
1958	2,499
Export Sales Lost	**13,819**

U. S. IMPORTS

	NET TONS
1949	7
1958	39,671
Domestic Sales Lost	**39,664**

Add the 13,819 ton decline in U. S. exports to the 39,664 ton increase in imports and you see that American producers of woven wire fence have lost a market for 53,483 tons of their product in the last decade. Reason: U. S. producers can't meet the low price of the imported material. The outlook is even darker: Some makers say they'll have to raise their prices later this year if steelworkers get a wage hike (Page 131).

More Top Jobs Are Available

Executive job opportunities are 59 per cent above what they were a year ago, reports Heidrick & Struggles, Chicago executive recruiting firm. The volume of openings for financial executives hit a record high in February, reflecting the marked emphasis on cost control. Defense engineering openings increased 149 per cent in the last year; competition for men in this category will continue to be tough. The placement firm says we're in a postrecession period of accelerating sales and research programs, creating an intense demand for men in the $25,000 to $40,000 salary bracket.

How to Solve Export Problems

You might cash in on overseas opportunities by establishing foreign subsidiaries. Rheem Mfg. Co. is one diverse manufacturer that is doing it (Page 68). A. Lightfoot Walker (right), president, believes that in a few decades domestic sales of some American companies will be dwarfed by their sales abroad. His firm has more than 20 associated or licensed plants around the world. Sales of its foreignmade products hit $35 million last year—up $1 million from '57. Rheem's equity in foreign facilities is estimated at $5.9 million.

GNP May Hit $500 Billion Rate

The Gross National Product will probably hit an annual rate of $485 billion to $500 billion by yearend, say government economists. The estimates were jacked up as the Council of Economic Advisers officially placed first quarter output at $465 billion annually—$12 billion above the rate in 1958's final quarter.

Want to Sell Your Share of Sunlight?

Ford Motor Co.'s Dr. Lawrence Giacoletto suggests this for solarpower (using sunshine to generate electricity): Instead of trying to store what you don't use, turn the excess back into the power lines for industrial use. Result: Power companies would pay instead of bill you. A bank of semiconductor solar energy cells on a Detroit housetop would generate three times as much power as the home owner would use, says Dr. Giacoletto. Result: A potential net return of $200 annually.

Will This Process Revolutionize Steelmaking?

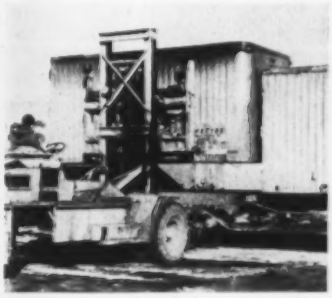
Frank Madrigal may have developed a practical direct reduction process. His method reduces iron ore to steel in 35 minutes (Page 100). Cost: $30 to $35 a ton. (The saving in an average steel mill would be $20 to $25.) The process eliminates scrap and coke, shows potential as a commercial base for production of high grade aircraft alloys. Most steelmen are impressed. They say they can't afford not to examine the process. Early results look good.

Fruehauf Markets Stainless Trailer

A new trailer, made of Type 201 stainless steel, is being produced by Fruehauf Trailer Co. at Ft. Wayne, Ind. A medium model uses 2100 lb of stainless. Freuhauf says unit-welded structural members cut costs. The company is aiming at a larger share of the growing trailer market. One manufacturer predicts 60,000 trucktrailers will be built this year and 175,000 will be needed by 1975.

Piggybacking Outlook: A 50 Per Cent Gain

Piggyback carloadings this year may average 7500 to 8000 units weekly—50 per cent better than last year's pace. The Chesapeake & Ohio Railway has even added piggyback flatcars to two of its crack passenger runs between Staunton, Va., and Charleston, W. Va. In 1954 (piggybacking's first year), only 18 roads were in the business; now, 48 are involved. (Page 55).



Checker Cab's Passenger Car Coming

Checker Cab Co.'s entry into the passenger car market is expected to be announced soon. The six-cylinder Superba, about 2 ft shorter than any

other American car, will have an overhead valve engine rated at about 140 hp. It'll sell for around $2500, with power steering, power brakes, and automatic transmission.

Steel Investigation Launched in West

Expect about 30 steel companies to be called before a federal grand jury in San Francisco during the next four months. The Justice Department is investigating alleged price fixing and channelization by major steel companies. It follows the filing of civil damage suits by several west coast steel fabricators who charge that some of the big steel companies discriminated against them in favor of their own subsidiaries. Among the defendants: U. S. Steel Corp., Bethlehem Steel Corp., Kaiser Steel Corp., and Youngstown Sheet & Tube Co.

Plastic Challenges Diecastings

Delrin, a new Du Pont plastic to be marketed in June, promises competition to makers of aluminum, zinc, and brass diecastings. The plastic's tensile strength: 10,000 psi at room temperature. Price: About 95 cents a pound. Savings in machining, finishing, and shipping costs are supposed to make it competitive. Proposed uses include auto parts, gears, bearings, bushings, hardware (Page 106).

Auto Market May Double by 1975

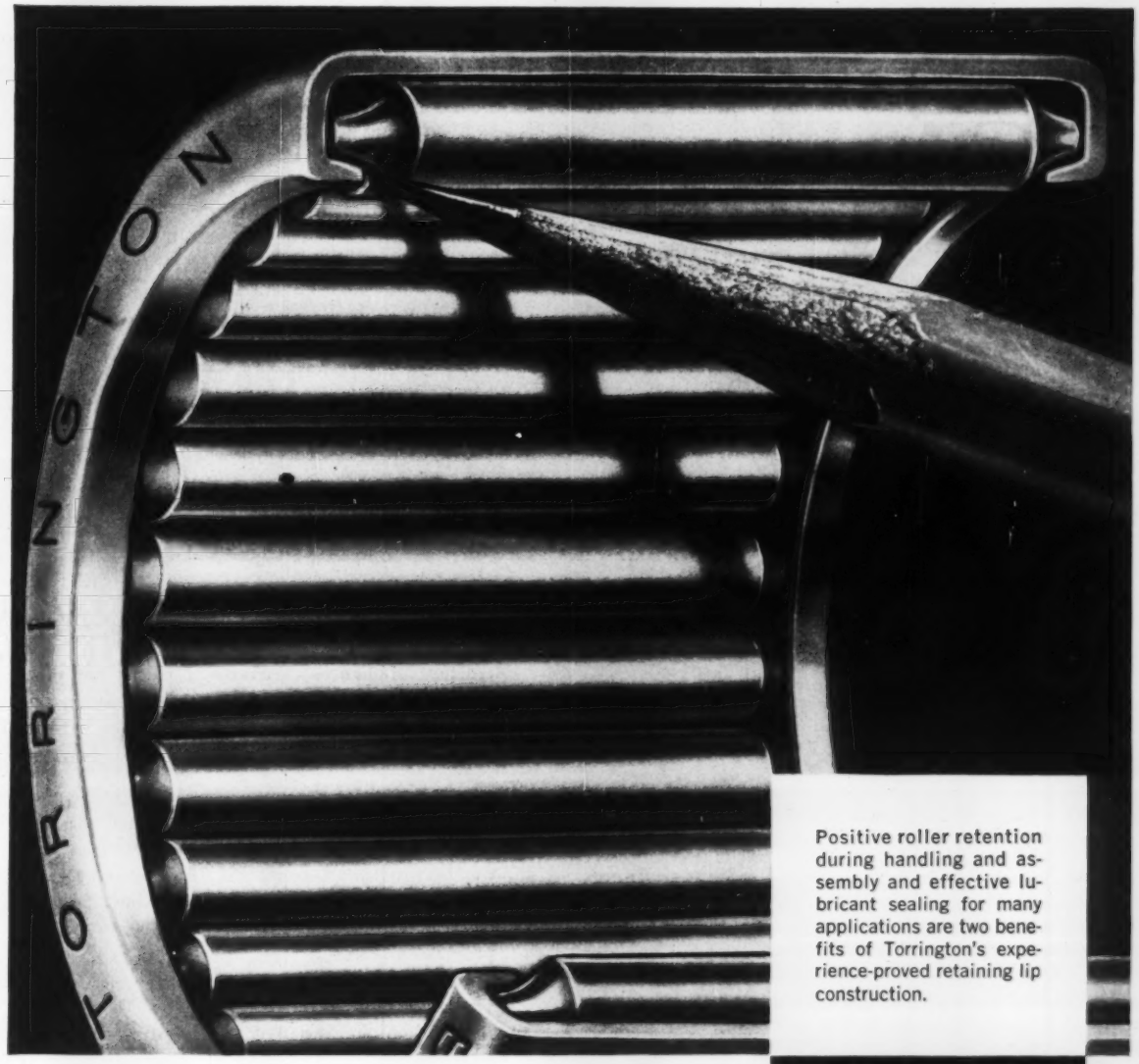
There will be a market in the U. S. for 9.9 million to 11.5 million passenger cars by 1975, predicts Robert Eggert, market research manager, Ford Motor Co. His market predictions for other years: 1960—6.1 million to 6.7 million; 1965—7.2 million to 8 million; 1970—8.1 million to 9.5 million.

Aluminum Packaging to Double

In 1953, only 110 million lb of aluminum went into packaging. This year, packaging will represent a 220 million lb market. By 1963, it will jump to over 400 million. So says F. J. Close, vice president, Aluminum Co. of America. He says packaging applications will double in the next five years. Aiding the growth is a machine for ultrasonic welding of foil, developed by Aeroprojects Inc. Mr. Close predicted that a hermetically sealed, foil-board carton might be developed by yearend.

Straws in the Wind

Net new orders for industrial furnaces hit $6.1 million in March—up 125 per cent from the February volume. It was the best month since September, 1957 . . . Marcus J. Aurelius, U. S. Steel Corp.'s administrative vice president, estimates 1959 ingot production at 110 million to 115 million tons . . . A United Steelworkers commission ended a 21-day wildcat strike at Woodward Iron Co., Birmingham, and recommended that the president and vice president of the local be removed from office.



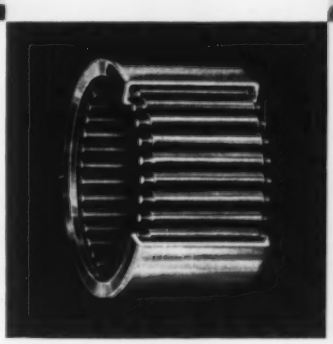
Positive roller retention during handling and assembly and effective lubricant sealing for many applications are two benefits of Torrington's experience-proved retaining lip construction.

This little lip makes a big difference!

The turned-in lip at each end of Torrington Needle Bearings positively retains the trunnion - end rollers and makes the bearing truly a complete unit, with no possibility of roller fall-out.

This unit construction simplifies installation and servicing. The closely controlled clearance and the large area between cup lips and shaft form an effective labyrinth seal. Also this retaining lip allows pregreasing the bearing with the proper lubricant for each application.

Long experience with the Torrington Needle Bearing in thousands of applications has proved the merit of this and other features in efficient performance and long service life. Make sure *your* product benefits from the best that experience has to offer—specify Torrington Needle Bearings. **The Torrington Company, Torrington, Conn.—and South Bend 21, Ind.**



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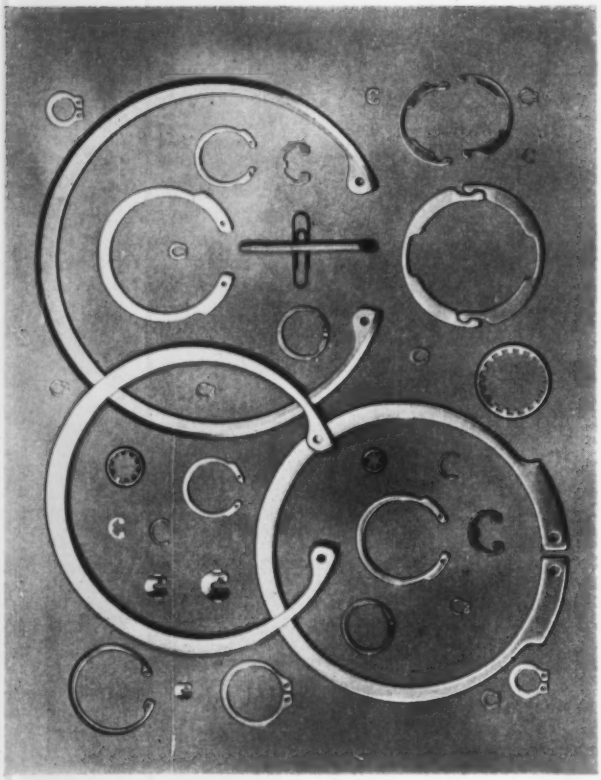
Retaining rings in a multitude of shapes and sizes are speeding assembly and cutting production costs of a host of industrial and consumer products. A leading manufacturer of these efficiency-improving parts recently greatly expanded the range of applications for retaining rings by adding a complete line of standard and special rings of Armco PH 15-7 Mo Stainless Steel.

By taking advantage of the ultra-high strength, spring properties, good corrosion resistance and high temperature properties of this unique metal, they now produce retaining rings with performance characteristics heretofore unobtainable at reasonable cost. Their new PH 15-7 Mo rings have the necessary combination of strength and durability for economical service in chemical, food and beverage machinery; aircraft and missile components; units for nuclear

How Armco PH 15-7 Mo Stainless Steel Helped make a good product better



reactors, appliances; marine equipment; and other applications subject to severe service conditions.

Simplifies Ring Production

The simple heat treatment and good fabricating characteristics of Armco PH 15-7 Mo facilitate manufacturing operations. All types and sizes of rings can be produced because PH 15-7 Mo is available in sheets, strip, plates, bars and wire, including special cold drawn shapes that completely eliminate some production steps.

Consider the design and production advantages *you* can achieve with Armco PH 15-7 Mo or one of its companion grades of precipitation-hardening stainless steel, Armco 17-4 PH or 17-7 PH. Let us send you complete information. Just fill out and mail the coupon.

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We Can Lick Russia—But

We can lick Russia, but can we defeat Communism?

The statement and the question appear to be contradictory.

But they are not. They were suggested by Adm. Arleigh Burke before the National Business Publications Inc.

The admiral spoke with knowledge and conviction based on his position as chief of U. S. Naval operations and his background as a seasoned international strategist.

He made these points:

The probability of a general war with the Soviet Union is remote, but we always must be prepared for it.

In case of war, the U. S. would suffer severe damage, but the Soviet Union would be destroyed, and the Soviets know it.

With ballistic systems which cannot be neutralized by sneak attack, we will know that we can destroy the Soviet Union even though it strikes a surprise blow.

But we must maintain a military posture which makes it unprofitable for the Soviets to start a general nuclear war.

We also must neutralize the psychological force which has become such a powerful weapon in the hands of the Soviets.

If they can get what they want by causing us to give in under their pressure, to give control of more people, to permit nations who want to be free to be dominated by Moscow, then the Communists will be able to state that we do not really believe the principles we profess.

In fact, we, as a people, may have begun to lose sight of what we really are for.

Admiral Burke's analysis should not be taken lightly. The Soviets expect to achieve world domination through intimidation and economic aggression without resorting to outright war.

To sustain our ability to lick Russia, industry will need to provide the necessary hard goods.

To defeat Communism, individuals will need to reaffirm, especially to our young people, the virtues of personal achievement and responsibility under our free enterprise system.

Irwin H. Such

EDITOR-IN-CHIEF

MILWAUKEE WROT WASHERS

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Clean washers are essential to today's high standards of clean workmanship. Your assemblies — down to the last nut and bolt — must be clean.

When you use Milwaukee *washed washers*, workers' hands are kept clean. Cleaner workmanship results, assembly lines move faster, costs are lower, profits higher, your customers better satisfied! There is no grease, grime, graphite or other foreign matter to rub off on workers' hands or the work they are handling.

As a plus value, the Milwaukee Wrot Washer washing process includes rust-resistant treatment. It is used on all popular sizes of U. S. Standard and S.A.E. Washers, Rivet Burrs, and Machine Bushings.

Since the introduction of this washing process, industry has specified Milwaukee *Washed* Wrot Washers in a BIG WAY — but whether you specify "washed washers" or not — that's the way they reach you. Clean as a whistle, and made to match your own high standards of quality and cleanliness!

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In keeping with a policy of "dressing up" the washers themselves, by our special washing process, they are now put up in convenient, attractive 1-lb. and 5-lb. packages for easier identification and handling.

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When Steel Starts Bargaining May 5, Here Are Initial Positions of . . .

MUCH TALK and probably a strike will come before the denouement in the steel labor drama. The first act in the most publicized labor play in U. S. industrial relations history starts May 5.

The two sides will eventually get down to this: A package demand by the union of 11 or 12 cents hourly per year of the agreement; a counteroffer by the steel companies of a few cents in wages and a few more in fringes to save face for the union but to be noninflationary.

• **The Wage Issue**—In wages alone, steelworkers have set 7 cents as the minimum wage gain they'll settle for. It's what autoworkers get next August. If the wage provisions in the present steel contract were extended, the workers would get an hourly increase of 7 cents on July 1, plus a 0.2 cent boost in the increment between job classes. That total would average out at a little more than 8 cents.

• **Inflation at the Core**—The basic theme of the labor play will be the fight against inflation. That's why much of the dialogue will revolve on two hot points—productivity and the wage gap between foreign and U. S. steelworkers.

• **Productivity** — The steel union claims productivity is merely output per manhour. Companies say much more is involved—including equipment costs, taxes, maintenance expenses and other overhead.

When you take into account the contribution of men, machines, materials, money, and cost of government, the steel companies see a 2.3 per cent average annual rate of increase in productivity in the private domestic economy since 1940. Hourly employment costs in steel have increased annually at a 7.5 to 8.0 per cent rate since that date.

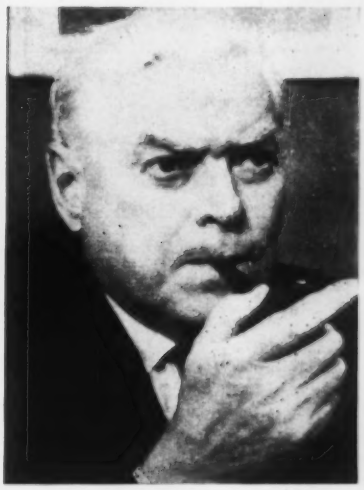
By taking only output per manhour into account, the steel union claims a 3.1 per cent average annual productivity increase in steel since 1939. But it was recently embarrassed by the release of the Bureau of Labor Statistics' index on steel output per manhour for 1958. It dropped 5 per cent from 1957's. The union hastily explained that productivity figures for 1957 and 1958 have "no meaningful significance for the long range trend." Nevertheless, it is also arguing that output per manhour in the first half of 1959 is showing a 10 per cent gain over all of 1958.

Steel companies might go along with the argument that employment costs could go up as much as productivity and not cause inflation if the productivity figure were realistic. How the two sides agree (or disagree) on the way to define and measure productivity could determine the course of negotiations.

The 11 or 12 cent figure which the union will fight for results from multiplying the union average productivity percentage of 3.1 by $3.60. That's the current hourly average employment cost in steel. Labor observers point out that you get a figure of 8 cents from multiplying 2.3 per cent (the industry claim for average productivity improvement) by $3.60. They argue that will be the absolute top limit the steel companies will stand for in increased

Steel Companies' R. C. Cooper

. . . Continue present wages, benefits without change



Steel Union's David J. McDonald

. . . Boost wages, benefits 30 cents per hour

What Steel Companies Want in New Labor Contract

1. Employment cost increases limited to no more than increase in real productivity.
2. Cost-of-living clause eliminated (or at least changed). The escalator provision in the 1956 contract gave workers 17 cents over three years.
3. Elimination of Section 2-B. It states that "practices that have been in effect will remain in effect for the life of the contract." The union and arbitrators interpret this broadly to include crew sizes and related matters, in addition to wages and hours. It has been estimated that 2-B costs steelmakers at least 6 cents an hour in inefficiency by slowing technological change.
4. Changed incentives. Many are out of line.
5. A two or three year contract. Industry wants assurance of stability.
6. Better union responsibility. Industry wants more safeguards against wildcat strikes.

What Steel Union Wants in New Labor Contract

1. A wage increase.
2. Continuation of the cost-of-living clause.
3. An annual improvement allowance based on better productivity (output per manhour).
4. More supplemental unemployment benefits.
5. Better pensions, including retirement on full pension after a certain number of years' work, as in government service. Age wouldn't be a factor as it is now.
6. More insurance, with hospitalization costs to be borne entirely by companies.
7. Longer vacations for those who got nothing additional last time: Men with less than three years' service; men who have worked five years but less than ten; men who have worked 15 years but less than 25. Three months' paid vacation after every five years' employment.
8. Increased premiums for Sunday and holiday work.

hourly employment costs.

• **The Wage Gap**—The second hot point in the steel parleys will be the wage gap. U. S. steelworkers averaged $2.917 an hour in 1957, three to eight times the 82.7 cents paid in Britain, 69.4 cents in West Germany, 58.3 cents in France, 55 cents in Italy, and 36.1 cents in Japan.

The result has been a steady rise in steel imports to this country and a drop in exports. In a decade, for example, U. S. shipments of reinforcing bars rose 29 per cent—from 1.6 million tons in 1949 to 2 million in 1958. But imports in that period skyrocketed 4500 per cent—from 10,000 tons in 1949 to 473,000 tons in 1958.

The steel companies will argue that the wage gap must be narrowed, or at least widened no farther, or the U. S. steel industry will lose more of its markets and more of its jobs. Since 1954, rising imports and declining exports have already cost us more than 14,000 jobs.

• **Time and Place**—The first scene in the steel labor drama (to be held in New York City's Hotel Roosevelt) will be brief. The main characters will set the stage and state the ground rules. When that's done next week, the curtain will fall until late May or early June when the second act will begin with talks between the two, 4-man teams. Protagonists don't know what will develop in the third act, but odds are action will include a strike.

Act I is actually starting 13 days earlier than originally planned, but it still seems to have been a long time coming because of the lengthy prologue. It has been running since the turn of the year and has featured admonitions by President Eisenhower (to keep the settlement noninflationary); a battle of guided epistles between labor and management (urging price and wage freezes); speeches from both sides.

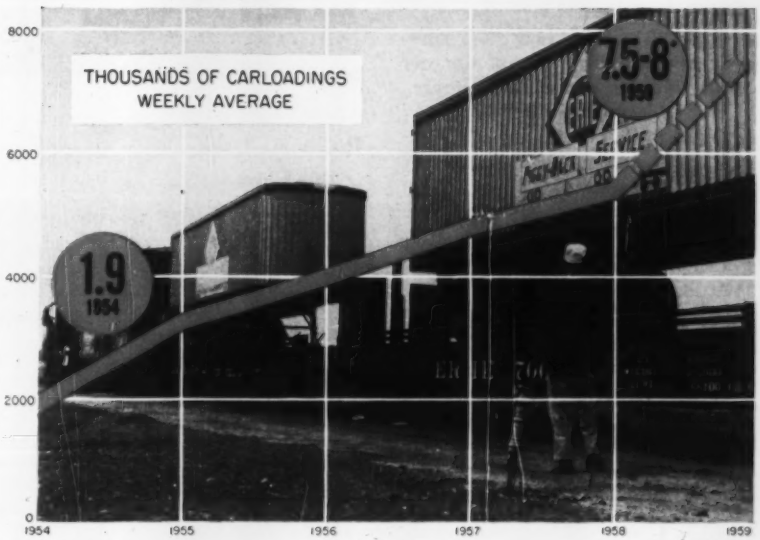
At least one more episode in the prologue is still to come. This Thursday and Friday the United Steelworkers' wage policy group meets to O.K. demands decided Apr. 13 and 14 by the union's executive committee. The USW may reveal its demands publicly before May 5, but only in general terms. Yet the outline of those demands (and the companies' position) can already be seen (see above list).

• **Noneconomic**—In the noneconomic area, two management issues will meet stiff union opposition. Section 2-B in the contract limits the industry in its drive for technological improvement. The clause has been in the contract in its present form since 1947, and it was one of the causes of the 1952 strike.

Another problem is union responsibility. Wildcat strikes are not as bad this year as they were in 1956, but they're bad enough. Management wants them stopped. Here's another issue that may lead it to accept a strike this summer to win a better labor pact.

Piggyback Volume on the Climb

New methods, new tariffs raise the cadence of this fast stepping youngster



Source: Car Service Div., Association of American Railroads.
*Estimated by STEEL.

A RECORD BREAKING week in carloadings of piggyback truck vans early this month sets the tone of the year's outlook for the young industry.

STEEL estimates this year's average will hit 7500 to 8000 units weekly. Such a jump over last year's pace (50.3 per cent) is not unique. Gains of 70 per cent or better have been commonplace.

• Piggybacking puts every plant with a truck dock on a rail siding.

Some of the happiest supporters are the smaller firms which don't have railroad carloading facilities. Every shipper gets door to door service.

Ease and speed of handling cargo are attracting some shippers that have not been able to use the rails' relatively long haul facilities. In many cases, piggyback loads can be shunted around congested switching yards and arrive in half the time required by a conventional boxcar.

To speed up deliveries to customers that cannot unload directly from railroad cars, Jones & Laughlin Steel Corp. started piggyback deliveries from its Aliquippa, Pa., Works this year. Two railroads, the Pennsylvania and Pittsburgh & Lake Erie, truck from the mill to their nearby freight stations and forward the truck vans by rail.

• The method is now moving in the best circles.

The Chesapeake & Ohio Railway made its initial venture into piggybacking this year with "highball" freight service on its Chicago-Detroit and Chicago-Cincinnati runs. The C&O has since added piggyback flatcars to two of its crack passenger runs between Staunton, Va., and Charleston, W. Va., a move which offers top speed to shippers and neatly offsets some of the road's passenger deficit. Adding to its fleet of 50 ft and 85 ft flatcars, the C&O this month ordered 50 more 85 ft cars, which carry two over-the-road trailers. The Berwick, Pa., shops of American Car & Foundry Div., ACF Industries Inc., got the order.

• Railroad car spending is a key to optimism.

Railroaders are understandably excited about piggybacking's prospects. As freight volume sagged lower last year (down 15 per cent from 1957's), piggyback operations climbed 11 per cent. Traffic hit a record 276,767 cars vs. 249,065 the year before. Altogether, 48 American railroads are doing piggybacking; 43 originate the service; the others act as bridge or terminal lines. At the end of 1954, piggybacking's first year, only 18 roads were in the business.

Railroad investment in piggyback stock is picking up steam; some roads are designing and buying their own brands of over-the-road equipment. For example, the C&O is developing its plans for "Railvan," a combination vehicle with two sets of retractable wheels, to travel on both rails and highways. Last year, the New York Central spent 113 million for "Flexi-Van" equipment, a trailer with removable wheel assemblies built by Strick Trailers of Philadelphia, a division of Fruehauf Trailer Co. The road, now hauling more than 1500 trailers a month, bought 100 special flatcars, 300 new trailers, and 180 wheel assemblies.

• Railroad needs are prompting new methods, new designs.

The Nickel Plate Road tripled its 1955 piggyback volume last year. It has introduced another variation: Joining two 47 ft flats, which make a single, articulated flatcar 97 ft long, to accommodate two highway trailers.

The Erie Railroad is also going to the two-trailer design. Piggyback volume jumped 72 per cent last year, and the Erie foresees another 25 per cent gain this year.

The Minneapolis & St. Louis Railway expects to spend $500,000 on its fleet this year in anticipation of handling triple the 629 cars it hauled in 1958. The railroad will spend $15,000 on unloading ramps alone. The Chicago, Milwaukee, St. Paul & Pacific Railroad, a newcomer to piggybacking late last year,

has spent $1.5 million on equipment.

The Chicago, Burlington & Quincy Railroad, an early starter in the field, pulled 27,700 trailers last year vs. 15,700 in 1957. The Burlington owns 205 piggyback flatcars and is part owner of another agency which owns 1000 more.

The Chicago, Rock Island & Pacific Railroad, handling a wheelless container unit called "Convert-A-Frate," has seen its volume climb 55 per cent.

• Piggybacking cuts damage and theft losses.

Spector Freight System Inc., Chicago, is building a fleet of piggyback containers which are especially useful to LTL (less than truck load) shippers. Each container is half the length of the usual truck-trailer and can be handled with fork lift truck or ramp. Transfer of the whole container eliminates repeated handling and stacking of cargo. Handling of sealed truck vans instead of cargo is one feature which is cutting costs.

Damage claims against rails have dropped sharply where piggybacking is used, a big savings for companies which normally handle claims running up to 2 per cent of revenue. Theft losses, too, have declined since freight stays in the van during transit and is not left on loading docks.

• The method is getting railroads out of one stew and into another.

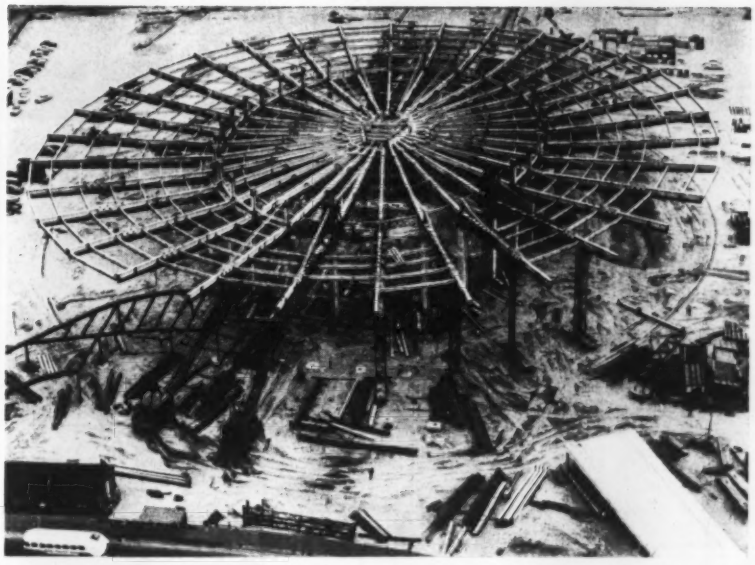
The lower costs of piggybacking have enabled freight forwarders to offer extremely low rates to shippers who will supply and handle their own equipment. Some rates, for goods moved on double trailer flatcars, are lower than LTL truck rates for the same trip. Complaints from truck operators that this kind of piggybacking is not legal business for forwarders have brought an Interstate Commerce Commission investigation. But until a final ICC ruling is made, the piggybacks roll on.

Devotees see an even bigger future in international trade. Some shipping lines are using piggyback containers, and expectations are for an increase here when the St. Lawrence Seaway brings ocean trade to midwestern railheads.

Railroaders Wage Fight Over Featherbedding . . .

Trainmen want a 14 per cent wage hike. The rails want to cut wages 15 cents an hour when present contracts expire Nov. 1. Railway Labor Executives Association predicts: "Negotiations will be tough as the rails can make them. You'll probably see fireworks." Here's where labor and management stand on major issue.

MANAGEMENT SAYS:	LABOR SAYS:
I Featherbedding	
Antiquated work rules cost $500 million in overstaffing, useless jobs for workers like firemen, brakemen.	The railroads' claim rests on a figure pulled out of thin air. It lists vacation pay as pay for work not done.
II Presidential Emergency Boards	
Board 109, in 1955, called for long overdue modernization of wage structure to eliminate wastes.	Modernization of wages would mean increases; impartial featherbedding decisions have been adverse to the roads.
III Lockout or Strike	
If these issues result in railroad tieups, the public will pay for economic disruption, personal hardship.	This can be regarded only as a threat of lockout if labor and the public do not surrender to management demands.
IV A Day's Pay	
Mileage-day pay is up sharply as even average train speeds have almost doubled since 1919; crews on slow trains are generally paid on time basis.	The basic day's pay cannot be compared with an 8 hour day scale; for every high speed passenger run, there are scores of slow freight jobs paid on mileage basis.
V Obsolete Firemen	
A Canadian Royal Commission finds firemen on diesels unnecessary; their functions have either disappeared, or they duplicate other jobs.	Firemen, or diesel helpers, are as essential to safety as engine trainees, lookouts; Canadian Pacific Railroad will be short of skilled engineers in five years.
VI Extra Time Wages	
Yard employees do get extra time pay; road service rules give trainmen higher wages in lieu of night, travel allowances.	Night, Sunday and travel differentials are paid in most other industries. Road service rules are attacked by AAR in "featherbedding."
VII Employment Costs	
All employment costs are 67% of total expenses, 53 cents out of revenue dollar, 10 cents higher than in late 1920s.	Ratio of passenger service wages to passenger expenses has dropped since 1939, ICC figures show.
VIII Productivity	
Traffic units handled per paid hour are up 220% since 1922, but wages are up 304%; the same total labor force handles 4.4 times the 1900 traffic at ten times the annual pay.	Gross hourly earnings since 1939 are up 227% in manufacturing; up 215% in durable goods; up only 209% in railroading.



THE 2000 TON ROOF SKELETON of Pan American Airways' new passenger station at New York's International Airport extends over 200 ft from all sides of the three story building. Airliners will nose under the overhang to protect passengers from the weather

Allis-Chalmers Strike Ended

OPERATIONS RESUMED at Allis-Chalmers Mfg. Co. last week following settlement of an 11 week strike which idled 14,000 workers at eight plants.

The new UAW contracts expire Nov. 1, 1961. They provide annual wage increases of 6 cents an hour or 2.5 per cent (whichever is greater), the first being retroactive to Sept. 1, 1958. The other boosts will become effective Sept. 14, 1959, and Oct. 3, 1960.

Other terms include increases in supplementary jobless benefits, life insurance, pension and disability payments, hospitalization, and a change in the method of funding supplemental unemployment benefits provided by the company. Cost of living allowances were continued and a no-strike clause was included in the contracts.

High Set in Highwaywork

Federal aid highwaywork underway on Mar. 31 set a record of $7.2 billion, a $2 billion increase over the same date last year. Of this, $5.2 billion represents the U. S. share of state projects under federal aid legislation.

By July 31, when the construction season is in full swing, work underway will rise to an estimated $8.1 billion, including $6 billion in federal funds.

Yard-Man Diversifies

Yard-Man Inc., Jackson, Mich., manufacturer of power and hand lawn mowers, has entered into an accelerated expansion program. Its diversification program includes a car for youngsters, a motor scooter, and a complete line of school furniture.

Acme Chain Expands

Acme Chain Corp., Holyoke, Mass., has added 2800 sq ft of storage space to its new plant which has 100,000 sq ft of manufacturing space.

A battery of Perkins' heavy duty presses has been installed for the assembly of Acme No. 200, 2½ pitch chain, completing Acme's line of precision roller chain.

Tool Engineers Talk About Capital Costs

MANUFACTURERS dissatisfied with federal depreciation rates on plant equipment have been told they can help themselves by "spending this year's depreciation dollars for this year's equipment at this year's prices."

• **Spend Now**—Discussing "Capital Costs and You" before the American Society of Tool Engineers at Milwaukee, Carl M. Beach, executive vice president, Heald Machine Co., Worcester, Mass., called attention to the steadily decreasing value of the dollar. Reference point: Based on the year 1900, labor costs have soared 1000 per cent; construction costs are up 550 per cent; and equipment costs have gained 400 per cent. Mr. Beach warned manufacturers to use depreciation dollars to replace obsolete equipment as fast as those dollars accrue. Otherwise, they may find rising equipment costs forcing them out of business.

• **Replace Facilities** — "These are days of intense competition and to the wise belong the spoils," he noted.

The speaker emphasized that timely replacement of productive facilities is a subject no forward-thinking manufacturing concern can fail to investigate.

Mr. Beach also discussed capital costs regarding manufacturing sites, types of building construction, and investments in inventory. Tool engineers were also drilled on the importance of patroling costs in labor, research and development, materials, inventory, and in other manufacturing operations.

• **New ASTE Officers**—President, Wayne Ewing, president, Arrowsmith Tool & Die Co., Los Angeles. The four vice presidents are H. Dale Long, president, Scully-Jones & Co., Chicago; William Moreland, vice president, F. E. Myers & Bro. Co., Ashland, Ohio; David A. Schrom, general superintendent, York Div., Borg-Warner Corp., York, Pa.; Phillip R. Marsilius, president, Producto Machine Co., Bridgeport, Conn.

Five Tips for Capital Goods Sellers

A MAKER of book matches built a roller gear drive for its index production system. Other companies showed interest. The company now has a subsidiary producing and selling the drive and related equipment.

• A rebuilder of graphic arts machinery needed a small, mobile crane to hoist its press components. A suitable one wasn't on the market. Now operating a small shop, he makes a profit on the crane and other types of material handling equipment which have limited markets.

• A manufacturer of test equipment had been building test stands for military jet engine components for ten years. Company officials prepared for the advent of commercial jet travel, and when it came, they had an international market.

Those firms enjoy new markets despite the slump in capital equipment buying. The routes they and others followed (see checklist—under cartoons) are open to you, too. They offer ways to put an end to the capital goods recession.

• **Universal Match Corp., St. Louis, developed a high speed roller gear drive for its own needs.**

The equipment gave the firm a competitive edge by boosting production 50 to 100 per cent in some operations. In 1950, 15 years after Universal had developed the drive, other companies became interested in the mechanism. Results of a market survey looked so promising that the company set up Ferguson Machine Corp. as a subsidiary to produce the drives.

Chronology: Today, the company is selling 75 standard drive units as well as variations. In 1954, Ferguson unveiled rotary and in-line indexing machines—another success. In 1956, the firm started producing automatic tooling for the two basic machines.

• **Tip**—If you want new markets, look at the equipment you have devised for your own use. Some items may have broader applications.

Do something with your leisure

• **Vanguard Engineering Co., Cleveland, an 18 month old organization, was able to enter the material handling field with new machinery because it's in the small shop category.**

Some products cannot be touched by a large company because the cost of tooling and manufacture would not be covered by the size of the initial market. Vanguard's experience proves that smallness can be a boon. It has seven material handling products and three more on the drawing board.

Inspiration for the products grew out of President Harold Isaacs' experience as the operator of a graphic arts machinery rebuilding and service shop in New York. At that time, he designed and built a small, hand-propelled mobile unit to hoist press parts. When he organized his jobbing shop in Cleveland, he started production of small cranes and ultimately developed an improved model with precise hydraulic controls.

Mr. Isaacs also perfected a basic battery power package for converting hand pushed equipment to power units. It has many uses. One of his latest products is a shop van or mobile workbench that's battery powered. It has a telescoping platform which extends from 6 to 10 ft for overhead work. A workman can move to a maintenance site carrying as much as 2000 lb of equipment and supplies on the van.

In its short history, Vanguard has aggregated $80,000 in sales, and on the basis of current backlogs and pending contracts, Mr. Isaacs expects sales for this year to tally $250,000.

• **Tip**—Set up a small jobbing shop to launch production on limited volume items. Also watch for licensing possibilities. Many small shops would welcome a chance to produce specialty items for you.

• **A Detroit maker of test equipment for military jet aircraft engine components now produces and sells more than 85 per cent of the test gear used by commercial jet airlines.**

George L. Nankervis Co., a subsidiary of Peninsular Metal Products Corp., entered the military field in 1948. Company officers foresaw the coming of commercial jet travel and began to work on suitable

Don't overlook the obvious

equipment designs in 1957. The look ahead paid off. Commercial airlines around the world began to send in orders a year later. The company has sold more than $1 million worth of its $18,000 to $35,000 units. Benefit: The company has a more favorable market balance with 50 per cent of its business commercial. Previously, it did 50 per cent of its business in the up-again-down-again military market.

Nankervis officials credit many factors for the company's standing: It actively pursues new accounts and places emphasis on technical field service. It also presses for standardized testing procedures throughout the industry. In this instance, the firm was in a good position to take on the allied business, but without the one year jump in designwork, it could have missed an important market.

• **Tip**—Scan the horizon for possible developments in fields allied to your prime markets. When new markets do unfold, you can be halfway around the track before the starter's gun booms.

You may not be too big to handle it

• **A machine tool manufacturer in Euclid, Ohio, exhibited a multi-spindle drill at a national convention and hiked sales by $30,000.**

The exhibit met a big problem which faces capital goods salesmen—prospective customers usually want to see machines in action before they decide to buy. The firm, Zagar Inc., exhibited the machine at the Institute of Radio Engineers' national convention in New York and sold three complete units. Company officials report about 200 inquiries since the show closed. The machine, which has been on the market for five years, is said to have advantages for printed circuit work, but this is the first time the company has had such a sales spurt from one source.

• **Tip**—Display your wares, but be sure to hit the outlets that best serve your market.

Check what's on the other side of fence

Don't hide your "for sale" sign

• **Last month, a sheet, tin, and strip mill equipment maker brought out two new lines developed during the recession. They promise to be its biggest sellers this year and next.**

McKay Machine Co., Youngstown, follows the philosophy that research and development should not be curtailed during slack times; in fact, such periods give engineers and technical people time to concentrate on new ideas. Result: Two recession babies, a die shear and a cold roll forming line, which will bolster already strong lines of equipment. They will put McKay in a much improved competitive position.

The die shear line is suited for cutting 48 in. wide, 10 gage sheet steel at 200 ft per minute. It sells for about one-fifth the price of larger cutoff equipment and requires less space. Production advantage: An operator can program the machine numerically.

• **Tip** — When things get quiet around your shop, intensify efforts to develop new lines. When the slump ends, you'll be ready for buyers with more efficient equipment. (For more information

about McKay's die shear line, see Page 114.)

• The capital goods field abounds in similar examples of market development.

Dravo Corp. acquired the rights to a European steelmaking process and is designing and building plants for U. S. companies. Cooper-Bessemer Corp. is introducing five major lines in 1959—all in new market areas. (See STEEL, Apr. 20, pp. 62 and 92.)

Ask your customers what they will need in coming years. Westinghouse Electric Corp. just announced that it wants its divisions to buy more new machine tools and other manufacturing facilities than they have in the past. The goal: Purchase improved equipment to make better products to enhance its competitive position.

The ways are there. Whether it is through diversification, mergers, hard selling, or product development, new markets can be found.

With the Soaring Sixties just around the corner, the company that doesn't start exploring new market potentials today may someday refer to the next decade as the Sagging Sixties.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Here's GM Small Car Detail

The Big Three leader is keeping the publicity lid on plans to protect sales of its regular lines. But these are some of the facts about it that may be given stockholders May 22

GENERAL MOTORS CORP. is the only one of the Big Three that hasn't officially admitted it has a smaller car in the works. (Unofficially, it does have one.)

The story around Detroit is that the corporation may make the announcement at its annual stockholders' meeting, May 22. GM has avoided committing itself because the firm hasn't been sure it would proceed; it apparently feels that premature announcement could kill some sales of conventional models this year.

• Unofficial Prototypes—Prototypes of the light car are out, say STEEL's sources. Production buildups are slated for August at Chevrolet's former truck assembly plant at Willow Run, Mich. GM plans to use galvanized steel for the fenders and floor pan. The underside would serve as a rust inhibitor. The outside on the fenders would be painted.

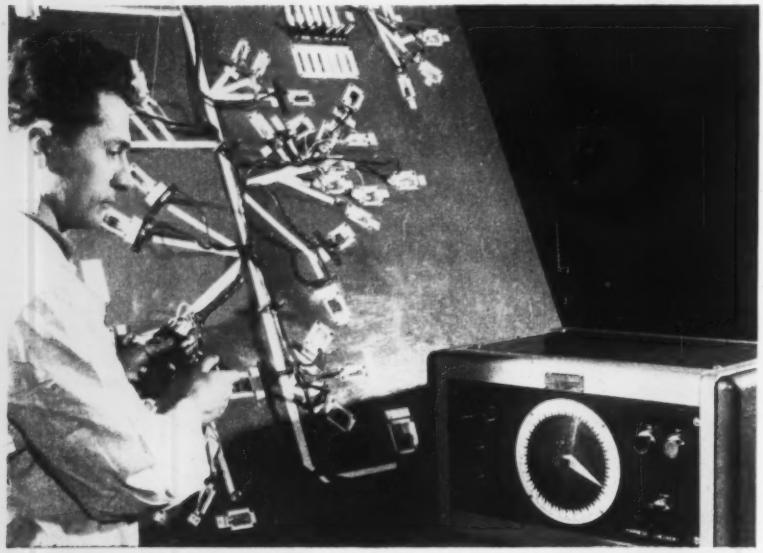
Four other Chevrolet plants in New York will turn out some of the parts. Production castings for the aluminum engine will start in the Massena plant in June. Engine buildups will come from Chevy's Tonawanda plant. The Delavan Avenue plant in Buffalo will handle some of the axle assemblies. Since Chevy will be using an air cooled engine in the light car, GM's Harrison Radiator Div., with plants in Lockport and Buffalo, is developing a small gasoline heater. Reportedly, it will go into production in late June.

• Confusion — Recently, there has been more confusion about the six cylinder, 92 hp engine that will power Chevy's light car. Initial reports indicated it would have gray iron cylinders sandwiched between a cast aluminum head and crankcase. More recently, stories have been leaking out of GM's Technical Center that cylinders will be all-aluminum too.

Apparently, the Tech Center has developed a method for casting aluminum cylinders and would like to sell this program to Chevy. But divisional production men supposedly are locked in on earlier designs and are afraid the aluminum cylinders would cause trouble because they haven't been fully tested. They'll probably make the switch later, but it still looks as though initial engine production will involve gray iron.

• B-O-P Projects—GM is moving ahead with light car plans for its Buick, Olds, and Pontiac (B-O-P) divisions. If the company decides to put them in the lineup, it's doubtful that they'll be out before 1962.

As the program stands, two V-8 aluminum engines are being considered for the B-O-P jobs. One has 185 cu in. displacement; the other is 230 cu in. Both are water cooled and are expected to be mounted up front. They will have aluminum bores and may use Teflon coated pistons. If the engines go



QUALITY CONTROL is vital in checking out wiring harnesses like this one at Ford's M-E-L Div. It carries electrical energy to 67 different front end components. Each connection is numbered. Faulty ones will stop the dial indicator, so defects can be spotted and corrected

up front, engineering sources claim the transmission must go to the rear.

Unitized construction is programed for the vehicles. They'll reportedly use the Chevrolet small car body shell and doors. Quarter panels, grilles, and other outside sheet metal will be different on each line.

Indian Firm Expands

International Finance Corp., Washington, will invest $850,000 in Kirloskar Oil Engines Ltd., Poona, India, for expansion and diversification of the firm's activities. Total expansion cost: $4.3 million. Upon completion, Kirloskar will be the largest diesel engine manufacturer in India. The firm is a publicly owned corporation.

The company exports engines to Asia, Africa, Central America, the Far East, and the Middle East. It also makes plows, pumps, machine tools, electric motors, and generators.

Collapsible Tubes Gain

Shipments of collapsible metal tubes were up 20.5 per cent in February over the same month in 1958. Shipments for the January-February period: 182.8 million, compared with 164.2 million in the year-ago period, an 11.3 per cent increase. Sharpest gains were in tubes for dentifrices and cosmetics. Substantial increases were also registered for medical and pharmaceutical products and household and industrial fluids and pastes.

Lube Demand to Be Up 5%

Demand for U. S. lubricating oils and greases will increase to 151,000 barrels a day in 1959 (5 per cent over 1958), predicts Thomas W. Phelps, manager, Economics Dept., Socony Mobil Oil Co. Inc., New York. Breakdown: Industrial use up 10.3 per cent; exports up 3.9 per cent; automotive lubes up 1.6 per cent.

Mr. Phelps says the industry will utilize 84 per cent of lubricating oil capacity this year. That represents a production boost exceeding 9 per cent.

Oxygen Steelmaking Rivals Open Hearth

"WE HAVE probably seen the last new, large open hearth shop built in the U. S.," declares R. N. Merk, chief engineer, Sharon Steel Corp., Sharon, Pa. "The trend to the oxygen process of low and high carbon steels and low carbon alloys is clearly established."

Earlier this year, Kaiser Engineers Div., Henry J. Kaiser Co., predicted oxygen steelmaking would account for 25 per cent of the nation's steel capacity by 1965. The score to date: Over 20 million tons in operation or under construction throughout the world. Of that, the U. S. accounts for 4 million tons. Most growth has been since 1952.

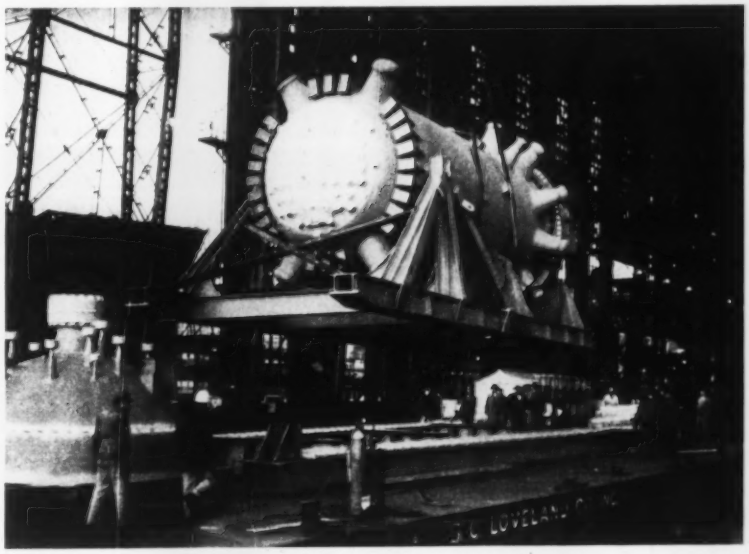
• **Cuts Costs**—Mr. Merk says oxygen facilities cost about $15 per ton of annual capacity, compared with $18 for electric furnaces and over $35 for open hearth furnaces (based on 1 million tons of annual capacity). In addition, lower brick consumption, higher metallic yields, and simplicity of operation give the oxygen process a decided cost advantage over open hearths.

Heat for the process is generated by using oxygen for combustion of carbon, silicon, manganese, and phosphorus in hot metal charged into the vessel. About 2000 cu ft of oxygen is required per ton of ingots produced, reports Mr. Merk. Steel scrap or ore added to the vessel cools the bath to control tapping temperature.

Low carbon steel made by the method is equal to open hearth steel quality, Mr. Merk says. Steel of similar analysis is slightly softer and better for deep drawing, he adds.

• **Better Scheduling**—Oxygen converters produce a steady flow of heats of moderate size to the soaking pits and rolling mills. That facilitates the scheduling of orders, an improvement over the open hearth practice, Mr. Merk explains.

"With more operating experience behind us," concludes Mr. Merk, "present 80 to 100 ton maximum heat sizes are certain to increase to 150 tons and larger in the near future."



THIS 300 TON REACTOR VESSEL is being put aboard a barge for shipment from New York Shipbuilding Corp., Camden, N. J. It will house the reactor core for the 180,000 kw Dresden power station of Commonwealth Edison Co. near Chicago. The plant is the largest nuclear generating station scheduled for this country and will start operating in mid-1960. The high pressure steel vessel is 42 ft high by 24 ft wide. Its interior diameter is 12 ft, and its walls are 5½ in. thick

Will McElroy Freeze Extra Funds?

IF CONGRESS appropriates extra funds for defense in fiscal 1960, will Defense Secretary Neil McElroy spend the money or put it on ice until fiscal 1961? That question has colored Congressional thinking about missile expenditures since the President submitted his budget message in January.

Mr. McElroy answers: Spending more money will depend upon "whether added information of an intelligence or research and development" character is received by the Pentagon. The secretary says: "I will not feel obligated to spend it immediately."

Congress added $600 million for the Polaris program (including submarine launchers) in fiscal 1959 and the Defense Department spent only half of it. Mr. McElroy also saved the extra Minuteman money voted, although the project's development was speeded a little by funds transferred from other programs.

Political implications: The Democrats could claim foresight in attempting to close the so called missile gap between U. S. and Soviet forces if Congress votes the extra money. The Republicans will charge their opponents with using the missile as a political weapon to set up an important debate issue for the 1960 Presidential election.

Will Congress Add New Money?

The defense secretary's statement should be viewed in these terms: The Republicans are becoming surer of their economy policies, as the nation recuperates from recession lows. They are also convinced the Democrats are becoming less sure that their plan to add billions to the fiscal 1960 budget is politically expedient. Two conservative Democrats on the House Rules Committee have lined up with four Republican members to keep the multibillion dollar housing bill in committee.

For an indication of the strength of the spending Democrats, watch what happens to the housing bill. It could be released from the Rules Committee if someone changes his mind; otherwise, a special vote by the House will have to take place to force its release. Democrat liberals have the power to move the whole House, but it will indicate more control if they first get a favorable vote from the Rules Committee.

SAC Seeks Control of Polaris

Interservice rivalry will reach the boiling point again in the next few months as the Air Force seeks operational control of the Polaris launching subs for the Strategic Air Command. The request has gone up to the joint chiefs of staff.

SAC argues for integration of all weapon systems (land, sea, air, and space), as necessary for the country's security. The Navy wonders why the AF didn't make the same pitch for control of aircraft carriers. With the air folks outnumbered among the joint chiefs, no favorable vote for SAC can come from there. Noteworthy opening: It means increased pressure on Capitol Hill for a unified service. Extensive politicking by the AF could make one service an actuality in the next decade. (Perhaps readers would like to air their views on the subject. Write: "Windows of Washington," STEEL, 1123 National Press Bldg., Washington 4, D. C.)

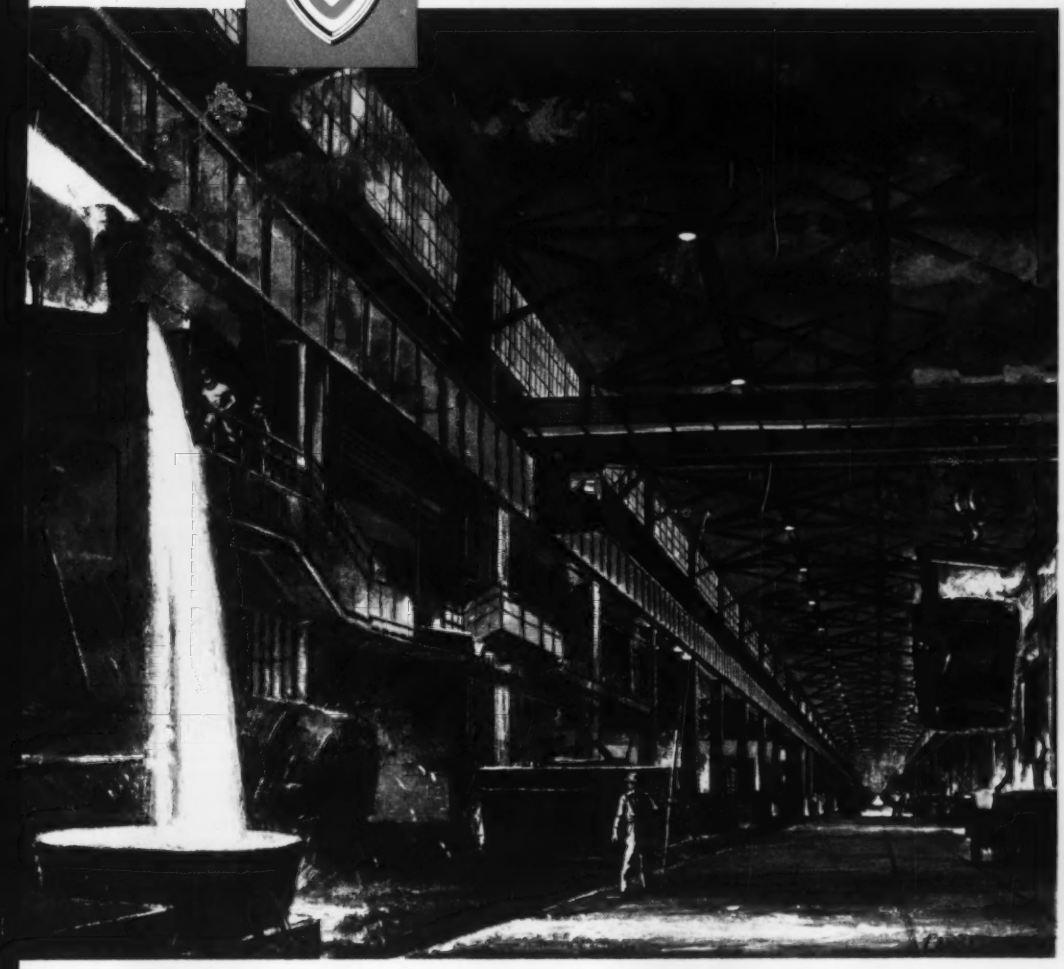
Long Fight Ahead on Foreign Aid

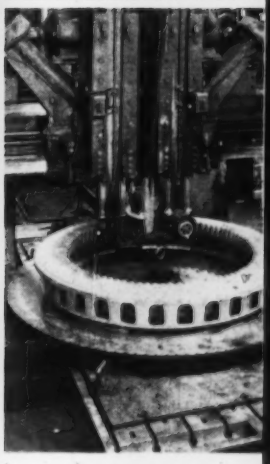
Five points made to the House Foreign Affairs Committee by Walter Harnischfeger, president, Harnischfeger Corp., Milwaukee: 1. Foreign loans made by Uncle Sam at cheap rates encourage governments to postpone cleaning up waste and corruption. 2. Such loans "carry forward dictatorially directed socialization programs." 3. Taxes paid by U. S. citizens to provide those loans deprive our own economy of needed capital. 4. Money spent by the U. S. to eliminate the slums of Harlem "generates more wealth for the world's use" than the same money spent on the slums of Calcutta. 5. Cheap loans encourage unsound investments.

Big emphasis in the administration's program is on Latin America: Technical aid would be increased 25 per cent; military aid, almost 100 per cent. A new look is also being asked for our African plans as the nationalistic movement there gains surprising strength. Meanwhile, the General Accounting Office told Congress the $600 million in aid to Pakistan (1952 through 1957) was more than the country could absorb and "indicated serious deficiencies in the administration of the aid program."

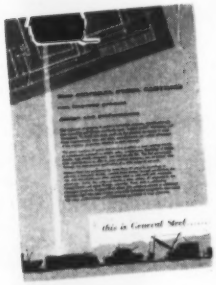
Since Korea, Congress has cut mutual security funds requested by the administration an average of 20 per cent annually. With Uncle Sam contributing $4.6 billion to the World Bank and the International Monetary Fund this fiscal year, opponents of foreign aid hope to persuade Congress to slice a bigger than usual chunk in the mutual security program. Outlook: A 25 per cent reduction, leaving mutual security at about $3 billion for next fiscal year.

...where industrial progress is cast in steel





PRODUCTION FACILITIES... COMPLETE AND MODERN



Write for folder: **How General Steel Castings Can Improve Product Design and Performance.** General Steel Castings, Station 230, Granite City, Illinois.

General Steel's large plants have complete facilities for producing, testing and machining castings to your specifications. Here are the facilities needed for quality production to suit your specialized requirements in cast steel structures . . . and steel castings used in cast-weld and composite structures.

Each plant maintains its own pattern, core making and molding departments, staffed by skilled craftsmen. Melting facilities capable of producing the correct steel for castings weighing up to 100 tons are complemented by the most modern foundry equipment available. Modern cleaning and finishing equipment, extensive heat treating facilities, specialized machine tools and the latest in non-destructive testing . . . radiographic, magnetic particle and ultra-sonic inspection devices . . . complete the picture.

General Steel's services range from application analysis before the product is designed to field service after the product is in use. Let us demonstrate how cooperative teamwork can make all this skill and knowledge available to you.

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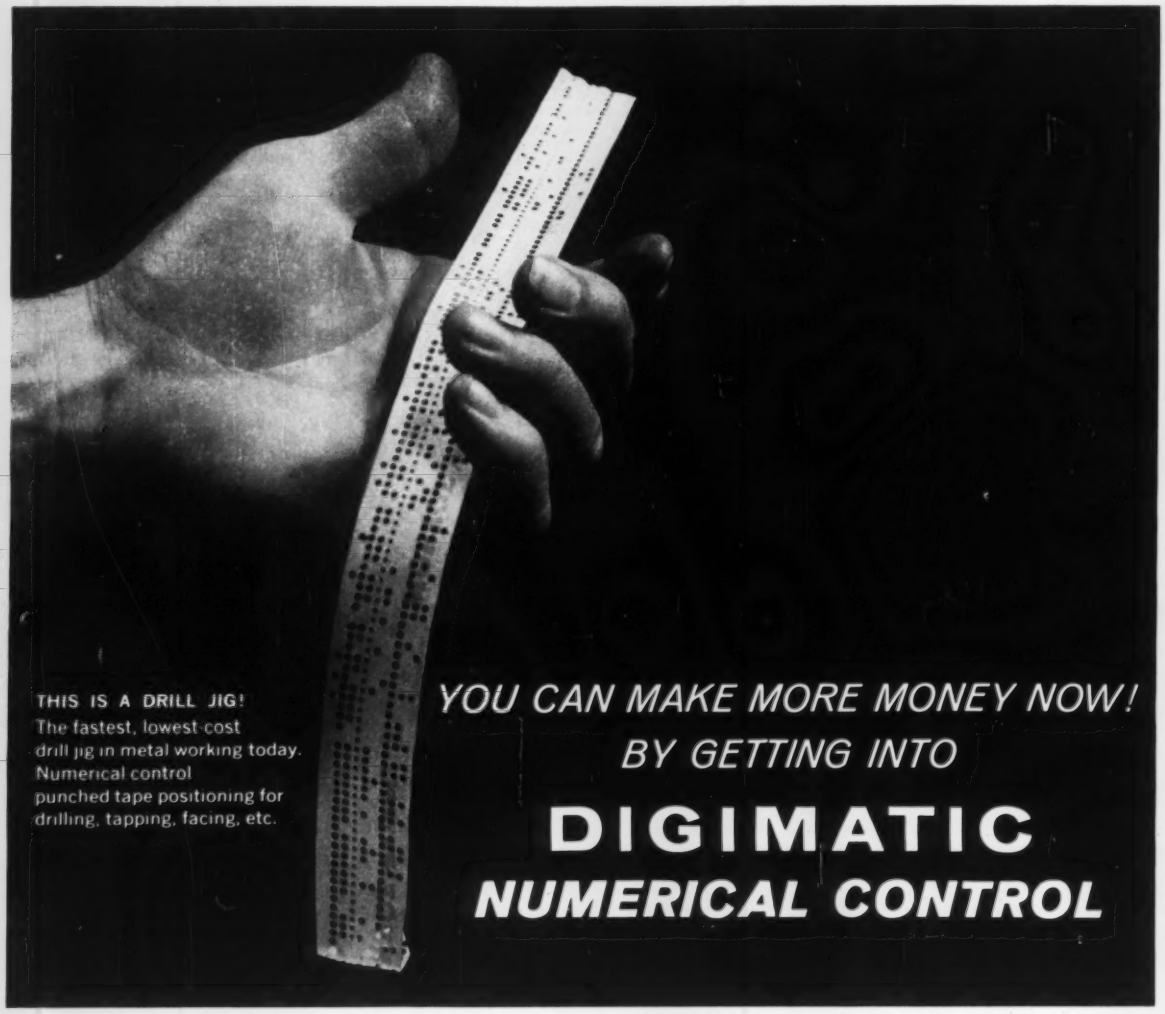

THIS IS A DRILL JIG!
The fastest, lowest-cost drill jig in metal working today. Numerical control punched tape positioning for drilling, tapping, facing, etc.
YOU CAN MAKE MORE MONEY NOW!
BY GETTING INTO
DIGIMATIC
NUMERICAL CONTROL

If you make a variety of parts, in small quantities (1-2000), and often have engineering changes—DIGIMATIC* 202 by Stromberg-Carlson can drastically reduce the cost per part. Here's why.

1. Reduces lead time—because tapes can be made much faster than drill jigs.

2. Cuts down on inspection time—because tape controls are *exactly* repetitive. There's no fatigue factor.

3. Shorter set-up time—only simple holding fixture required.

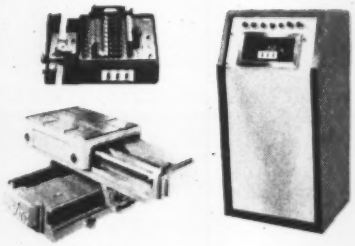
4. Eliminates scrap and rework due to human error.

In a typical application, the total cost per part for the production of forty parts was reduced from $7.87 to $3.29.

But more important, an engineering change order was effected in 15 minutes at a cost of $1.15 as opposed to conventional retooling costs of $38.40. A saving of 97%!

Every factor that would influence this cost has been considered. The cost of additional floor space, insurance, power, etc., and amortization required over the present machine tool for the DIGIMATIC 202 Control System is included. Complete details and photographs furnished on request.

The only complete, standard system. The DIGIMATIC Control System includes all equipment necessary for numerical control operation. It includes: *Special Punch Tape Preparation Unit* that is as simple to operate as an adding machine. No complicated computer language to learn. *Control Console*—compact unit, operator maintained, with shop-proven reliability. *Servo Table*—can be adapted to any existing machine in one day. Automatically positions work on ball bearing ways accurately and rigidly within 1½ seconds per hole.



Write for free 12-page booklet, "**DIGIMATIC Model 202**" containing complete details and illustrations. Also—movies shown at your shop or plant on request.

*"DIGIMATIC" IS OUR TRADEMARK

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A DIVISION OF GENERAL DYNAMICS CORPORATION • 1489 N. GOODMAN STREET • ROCHESTER 3, N. Y.

S-C | GD

U. S. Exports Off 14% in '58

(Billions of dollars)

Source: Department of Commerce.

Many reasons are cited for the slump. It shouldn't be accepted as a sign of lean years ahead, says Patten D. Allen, Department of Commerce. He sees a bright future now that most European nations are in a position to buy what they need. He cites five benefits U. S. trade will derive from the Common Market.

U. S. EXPORTS SLID from $20.7 billion in 1957 to $17.7 billion last year, a 14 per cent drop. Says Patten D. Allen, director, European Division, Department of Commerce: "It would be misleading to accept the downturn as a sign of lean years ahead. We must examine many interlocking forces to get a full, clear picture of the situation."

• **Many Factors Involved**—Mr. Allen elaborates: The closing of the Suez Canal in 1956 induced a temporary shift of fuel purchases toward the Western Hemisphere and a buildup of European stockpiles. Parts of Europe had freak weather conditions during that same year, creating a wheat demand we cannot expect to be repeated. Reduction of U. S. cotton prices in 1957 brought orders of massive scale.

"Subtracting wheat, cotton, coal, and oil, we still have a decline in exports, but the difference between the years is less sensational. In fact, 1958 would show a moderate improvement over 1955," he reports.

Part of the 1958 decline can be attributed to the end of a cycle. Europe has rebuilt its industry from the ravages of World War II (production rose more than 6 per cent annually from 1953 through most of 1957) and the Marshall Plan has ended.

• **Outlook Good**—"There may not be sudden surges of exceptional imports (into Europe), but the general trend is likely to be moderately upward," predicts Mr. Allen. European economy was on a sound basis at the end of 1958. The majority of countries have the financial resources to buy what they need. Public confidence is high.

Several nations have made their currency convertible to nonresidents. This action is favorable to American trade and will stimulate the economies of European nations. Previously, the selection of imports was frequently influenced by the kind of currency available.

• **Common Market to Help** — Although conceding that some external duties and quantitative restrictions are negative influences, Mr. Allen cites benefits U. S. trade will derive from the European Common Market:

1. The market will promote external as well as internal trade.

2. If it accelerates the economic progress of the area, the need for many types of production goods will be swelled.

3. Its ultimate purpose is to promote rising standards of living, which mean volume and variety of consumption.

4. Several hundred U. S. firms have interests within the market (subsidiaries, joint enterprises, licensing agreements). They will share its prosperity.

5. Although tariff handicaps may be insurmountable for a few products, duties on some goods will be low and others will be duty free. Some of our products are already meeting the most severe Common Market competition on its home ground.

Mr. Allen concludes: "The enlarged market will tend to sustain activity in hard times and accelerate progress in good years. It will surely give these U. S. customers more stability, prosperity, and confidence, than if they continued divided."

MARINER'S COMPASS, dated 1825 by Jonathan Bail, courtesy of The Smithsonian Institution

In every direction...

Eastern stainless sheets and plates are available *locally* . . . through the industry's finest DISTRIBUTOR WAREHOUSE NETWORK. Contact your local steel service center for prompt delivery of in-stock Eastern stainless . . . which may also include coils and strip . . . to meet production schedules and minimize your inventory, too.

EASTERN

STAINLESS STEEL

BALTIMORE 3, MARYLAND, U. S. A.

World's largest exclusive producer of stainless steel sheets and plates

RHEEM AROUND THE

Rheem Mfg. Co.'s history provides strong testimony that going international is a practical and profitable way to meet foreign competition. In 22 years, it has established affiliated and associated plants in 13 nations abroad, has plans to add another to the string. It also has licensees in three foreign countries.

ARE YOU TROUBLED by foreign competition? Are you prevented from invading rich European or South American markets because tariffs or shipping costs make exporting impractical? Are you alarmed over foreign inroads into your domestic markets?

• Establishing foreign subsidiaries might be a way to cash in on overseas opportunities. Rheem Mfg. Co. is one diverse manufacturer that has done it.

A. Lightfoot Walker, president, believes that in a few decades domestic sales of some U. S. companies will be dwarfed by their sales abroad. His conviction is reflected by his company's network of more than 20 associated or licensed manufacturing plants around the world (see map).

Rheem first moved into the international scene in 1937 when it established a steel container manufacturing operation in Australia. Mr. Walker, reared in Australia, was hired to run it. The company now has six Australian plants making Rheem products.

In addition, there are affiliated and associated plants in Argentina, Brazil, Canada, England, Italy, New Zealand, Peru, Manila, Singapore, Spain, Sweden, and Venezuela. Licensees can be found in Belgium, England, Brazil.

Plans are also underway for a new plant in Chile.

Rheem is planning to send an American to Chile to aid in the management of the new plant there, but nowhere else in the company's network of plants is an American national found in the management of affiliated companies.

• Rheem insists that its affiliates have a high degree of autonomy.

Rheem, of course, is represented on the boards of the companies involved, but broad authority and responsibility for decisions and operations are delegated to local interests who usually are part owners. Only in Peru is Rheem sole owner of its associated company.

Mr. Walker reports that the method of development of an associated company has usually been to join with local firms or individuals and to start with the manufacture of a single Rheem product line. Expansion comes through reinvesting a predetermined percentage of income in the operation. This means, of course, that in the initial stages a fairly high share of earnings is plowed back into the operation until regular dividends can be paid.

But company officials add that the type of arrangement agreed upon is tailored to the requirements of each situation. In some countries, they report, the local situation may indicate that substantial Rheem equity in the operation is most likely to result in mutual benefit. In others, a licensing arrangement may be most advantageous. But the company points out that licensing "usually is a prelude to getting in deeper."

WORLD

• U. S. Plants

Downey, Calif.
Fullerton, Calif.
Richmond, Calif.
Riverside, Calif.
South Gate, Calif.
Stockton, Calif.
Vernon, Calif. (2 plants)
New Castle, Del.
Chicago
New Orleans
Sparrows Point, Md.
Linden, N. J.
Metuchen, N. J.
Monaca, Pa.
Houston
Tacoma, Wash.

★ Affiliated and Associated Companies Abroad and Plant Locations

Sociedad Anonima Industrial y Comercial de Aceros Rheem (SAIAR)
Buenos Aires, Argentina

Rheem Australia Pty. Ltd.
Sydney (2 plants); Brisbane; Melbourne; Fremantle; Adelaide

Rheem Metalurgica S. A.
Rio de Janeiro and Sao Paulo, Brazil

Rheem Canada Ltd.
Hamilton, Ont.

Rheem Lysaght Ltd.
Bristol, England

Solartron-Rheem Ltd.
Thames Ditton, Surrey, England

Rheem Safim S. p. A.
Milan, Italy

Rheem New Zealand Ltd.
Wellington, New Zealand

Rheem Peruana S. A.
Lima, Peru

Rheem of the Philippines Inc.
Manila

Rheem-Hume (Far East) Ltd.
Singapore

Fabricacio de Envases Metalicos S. A.
Barcelona, Spain

Rheem Elit Emballage
Dals Langed, Sweden

Industrias Venezolanas van Leer S. A.
Punto Fijo, Venezuela

★ Licensees Abroad and Plant Locations

Travail Mecanique de la Tole S. A.
Forest-Brussels, Belgium

Solartron Electronic Group Ltd.
Thames Ditton, Surrey, England

Soc. de Comercio e Refrigeracao Springer Ltda.
Porto Alegre, Rio Grande do Sul, Brazil

Harris Engineering Co. Ltd.
London, England

Australian Heads Rheem

A. Lightfoot Walker was hired as general manager to open the first Rheem overseas company, Rheem Australia Pty. Ltd., in 1937. Immediately after World War II, he came to New York as executive assistant to the president. He was named vice president in charge of Rheem International Div. in 1951. In that position for five years, Mr. Walker built up a world-wide network of associated and affiliated plants making Rheem products abroad. He became executive vice president in February, 1956, and president in September that year.

• Rheem leans heavily on exchanges between plants of both managerial skills and technical assistance.

Mr. Walker himself, who started with the company in Australia, is one example of the way men are moved within the network of companies. More recently, Jack Tebyrica, a Brazilian who was managing director of an associated company in Rio de Janeiro, was named vice president of the new Rheem-Safim company in Italy.

Another advantage is typified in an agreement between Safim and Travail Mecanique de la Tole, a Belgian firm, permitting TMT to make and sell special type water heaters developed by Safim for the European market.

• The company also stresses the advantage to U. S. operations beyond merely making profits on foreign subsidiaries.

It says: "Not only are many original ideas and practical applications being developed in foreign countries, but they are being developed at less expense than they could be here. This is especially so where new products such as electronics are concerned."

• Plans are being made to take full advantage of the new European Common Market.

Other plans for international activity include possibilities of opening operations in Africa and the Middle East and expanding holdings in South America.

Sales of Rheem products manufactured abroad amounted to $35 million in 1958, vs. $34 million in 1957. These figures contrast with domestic sales of $151 million in 1958 and $189 million the previous year.

• Rheem investments in companies in foreign countries total more than $2 million.

However, because of appreciation since acquisition, its present equity in the facilities is estimated at $5.9 million. Rheem owns 30 to 100 per cent of its affiliated companies. Average equity, however, is just over 50 per cent.

HYATT
KEEPS QUALITY CONSTANT IN EVERY BEARING!

The unwavering accuracy of precision equipment allows pinpoint gauging and rigid quality control of every HYATT Hy-Roll produced. This, with long-respected HYATT craftsmanship, has made possible the manufacture of custom-quality bearings in mass-production quantity. *For maximum performance per bearing dollar, insist on . . .*

HYATT ***HY-ROLL BEARINGS*** **FOR MODERN INDUSTRY**

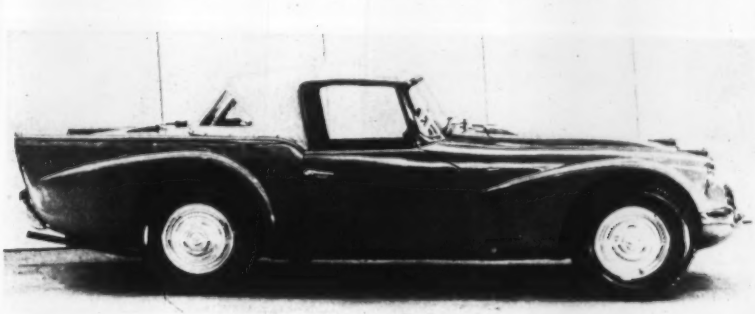
HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

Available through United Motors System and its Independent Bearing Distributors

NO BEARINGS carry radial loads like cylindrical bearings . . .
and NOBODY knows them like HYATT

Nobel's Do-It-Yourselfer and . . .

Daimler Dart's luxury sports car show how . . .



Imports Take New Tack

IMPORTED cars are selling better than ever. They accounted for 8.4 per cent of first quarter sales vs. 8.1 per cent a year ago. Lark and Rambler are raking in another 7.6 per cent vs. the 5.1 per cent they claimed last year. *Ward's Automotive Reports* points out that the Big Three's share of the market has slipped from a domineering 95.5 per cent in 1955 to 84 per cent this year.

• **Don't Be Coy**—As everyone but General Motors has admitted, antidotes for this onslaught on the Big Three are being tooled up now. Chevrolet and Ford light cars are expected to appear in September and October. L. L. Colbert, Chrysler Corp.'s president, has indicated his firm's entry will be ready next January.

Motordom is working hard to convince itself and any potential buyers that 1959 marks the high-water mark of foreign car penetration into the domestic market—although annual sales may grow larger as the total market expands. Forecasts of import sales range from 450,000 to over 500,000. James O. Wright, Ford Div.'s general manager, strikes a good balance with his estimate of 487,000.

• **Be Eager**—But as New York's international auto show proves, foreign builders aren't about to let up their efforts. At least 60 firms displayed their wares at the show. Judging from the programs shaping up overseas, if the importers can't buck the Big Three lines, they'll try some end-around plays to win more sales yardage. Nobel's 200 and Daimler's Dart are examples of what's on the way next year.

• **Different**—The British built Nobel 200 is particularly intriguing because it's a do-it-yourself job. Engine and chassis come in one package and the unpainted, glass fiber body in another. York Nobel, the car's designer, believes this is a gimmick no suburbanite can resist. He figures it will take Joe Do-It about 100 hours to assemble the car. A trained mechanic can do it in 80.

The three wheeled, four seater has an 81 in. wheelbase and is 126 in. long. It's 51 in. high, has a 9 in. ground clearance, and weighs 683 lb. It has chain drive and a synchromesh transmission.

The single cylinder, air cooled engine turns out 10.2 hp at 5250 rpm. It has a 6.3:1 compression ratio. Fuel consumption is rated at 80 to 90 mpg, but before you buy, notice that it takes a 1 to 4 mixture of oil and gas just like an outboard motor. The engine is accessible only by lifting up the car or crawling behind the rear seat. Asked what advantage this offers, Mr. Nobel explains: "Well, you must understand that a person can work on his engine in the rain without getting wet."

Asking price (f.o.b. New York) is $895 knocked down, or $1090 assembled. First year's production is scheduled at 5000, with 2000 units earmarked for the U. S. Shipments are supposed to start next month. When and if Mr. Nobel gets his dealer structure organized,

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he plans to market the pint sized runabout in New York, California, Florida, and possibly Texas.

• **Questionable**—To Detroit marketers, Mr. Nobel's venture sounds slightly absurd. They point to the Go-Go-Mobile as a similar, but unsuccessful, attempt. (Imagine nipping along the 500 mile run between San Antonio and El Paso, Tex., in a job like this.) But the Nobel does get into one market area that won't be covered by American light cars or more successful imports like Hillman and Renault. The price may make a few converts of folks who want a second car for suburban grocery shopping.

• **Or Fancy**—On the other end of the scale, it appears that importers are readying a return of high priced luxury and sports cars that will appeal to the buyer who "wants to be different." Daimler's Dart is on the fringe. The Dart is actually a two seater, convertible sports car, but it's a most luxurious one.

The powerplant is a 153 cu in. V-8 OHV mill with an 8.2:1 compression ratio. It has an electrical fuel injection system and is rated at 140 bhp at 5800 rpm. Heads are aluminum alloy; oil pump is submerged; and the axle ratio is 3.58:1.

Built in Coventry, England, the Dart is designed for road competition. Its glass fiber body is 160 in. long and 50¼ in. high with the top up. Wheelbase is 92 in., and tread is 50 in. at the front and 48 in. at the rear. Tires are 5.50 x 15. Four wheel hydraulic disc brakes are standard. Price: Around $3700. First imports are due late this fall.

• **Buyers Like It**—Other high priced imports are Volvo's forthcoming 122S, Jaguar sedans, Renault's Caravelle (STEEL, Oct. 27, 1958, p. 49), and the new car it's rumored that Volkswagen will offer as a separate line. The imports will match medium price cars in cost, but they offer superb quality, interesting and often attractive styling, plus many engineering features (disc brakes, for example) that aren't available on U. S. production cars. They're smaller than Oldsmobiles and Mercurys and many of them offer better economy. Like the Nobel, they have no direct competitors in this country, with the possible exception of Ford's Thunderbird.

By going around these two ends of the smaller car market, foreign automakers are expected to hold at least the 1.7 per cent of the market they had in 1956. But the job of getting another 7 per cent falls to cars like Volkswagen and Renault which jointly account for 32 per cent of all import sales.

It's going to be tough sledding in this field. Detroit thinks the VW and Renault will make out because they have good products, sound dealers, and effective replacement part organizations. A few other top-notch makers, like Volvo, have never wanted more than a few thousand American sales. They'll probably stay too. Among these you can count the American sponsored imports like English Ford, Opel and Vauxhall, Metropolitan, and Simca. Most of them are slightly smaller than Detroit's forthcoming smaller cars, and automakers want them for dealers who won't be getting the new jobs.

• **Builders Don't**—The rest of the imports in the $1800 to $2200 range will find themselves directly in the path of Big Three marketing power. Suppose next year's smaller car sales reach the 1.5 million units Motordom is starting to talk about. You can be pretty sure the cars mentioned here, plus the Big Three entries, will be accounting for close to 90 per cent of the market. In a 6 million car year, this leaves 150,000 units to be divvied up among some 40 or more producers. That might be enough to go around today, but look for fiercer competition among the importers next year. It's more likely that the big firms like Volkswagen and Renault will get bigger, and the fringe outfits will turn back to home markets which are growing faster than ours.

• **Prediction**—By 1962, we'll bet there'll be less than 20 serious contenders left in the U. S. market for imports.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,112
March	576,085	357,049
3 Mo. Totals	1,600,326	1,238,676
April		316,503
May		349,474
June		337,355
July		321,053
August		180,324
September		130,426
October		261,696
November		514,099
December		593,920
Total		4,243,526

Week Ended	1959	1958
Mar. 21	135,466	80,560
Mar. 28	121,832	93,844
Apr. 4	133,878	64,318
Apr. 11	133,202	84,997
Apr. 18	135,233†	73,219
Apr. 25	133,000*	58,664

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Ford Has Best First Period

First quarter earnings of Ford Motor Co. hit $134.8 million on sales of $1.47 billion, reports Henry Ford II, president. This is the highest first quarter in the firm's history and second only to Ford's 1955 second quarter when earnings reached $136.7 million. It's more money than Ford earned during all of 1958 ($116.2 million). The first period last year netted $29.8 million.

Mr. Ford says the company sold 466,077 cars and 82,548 trucks against 340,390 cars and 60,029 trucks in the like 1958 period. This gives Ford slightly more than 30 per cent of the first quarter industry market and strengthens the company's recent prediction that 1959 industry sales will top 6 million units.

Buick's Ragsdale Retires

Edward D. Rollert, 47, will take over as general manager of GM's Buick Div. on May 1, succeeding Edward T. Ragsdale, 61, who has decided to retire.

Mr. Rollert is the former general manager of GM's Harrison Radiator Div., Lockport, N. Y.

Mr. Ragsdale was responsible for the entire engineering and design concept of the 1959 Buick. He's best known in the industry as the man who developed the hardtop body style which GM introduced in 1954.

CASE HISTORIES

New Departure super precision angular contact bearings add new sales appeal to high frequency grinding spindles.

Photo: Courtesy Bryant Chucking Grinder Co., Springfield, Vermont

N/D Ball Bearings Cut Costs $180.00 On 100,000 RPM Grinding Spindle!

CUSTOMER PROBLEM:

Machine tool maker experienced excessive assembly time with integral shaft type ball bearings in the production of 100,000-rpm grinding spindles for precision grinders. The ball bearing, with ground shaft serving as inner race, plus special balls, separator and outer race, required careful parts matching and assembly. Also, shaft and bearing replacement costs, if required, were high.

SOLUTION:

N/D Sales Engineer, in cooperation with the manufacturer, recommended using New Departure production ball bearings fitted directly to the shaft. These super precision, ultra high speed ball bearings eliminated the need for ball track grinding and delicate eccentricity matching at assembly. Using N/D ball bearings and engineering assistance, the manufacturer reduced parts and assembly costs $180 per unit. What's more, in the rare case of spindle damage, shaft assembly replacement costs have now been reduced $175 (over earlier models) . . . shaft assembly or bearings can be replaced separately, thanks to New Departure.

If you have new machine tool designs on the board, or are experiencing questionable costs in production, why not call on New Departure? There's probably a high precision N/D production ball bearing that can save you time or money! For more information, write Department T-4.

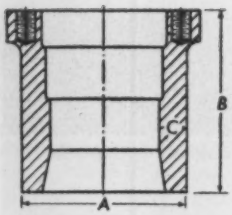
NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

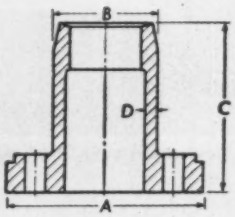
NOTHING ROLLS LIKE A BALL

THIS HOLE IN GRAPH-MO HOLLOW-BAR®

lets you make ring-shaped tool steel parts faster, at less cost



BLANKING AND FORMING PUNCH



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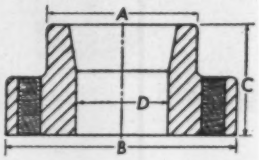
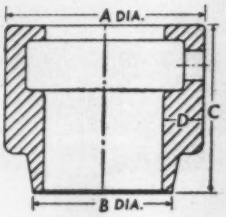


SIZING DIE



SIZING SLEEVE

START making your ring-shaped tool steel parts with Graph-Mo Hollow-Bar* and you save one operation immediately. You eliminate drilling because the hole is already there. Your first step is finish boring.

That's just the start of your savings. You can make parts faster because Graph-Mo machines 30% faster than ordinary tool steels. The free graphite in its structure is the reason.

Graph-Mo wears longer because of the diamond-hard carbides in its structure. Users report Graph-Mo outwears conventional tool steels by 3 to 1. And there's far less tendency to pick up, scuff and gall.

And for stability, you can't beat Graph-Mo anywhere. A master plug gage machined from Graph-Mo showed less than 10 millionths of an inch dimensional change *after 12 years of use.*

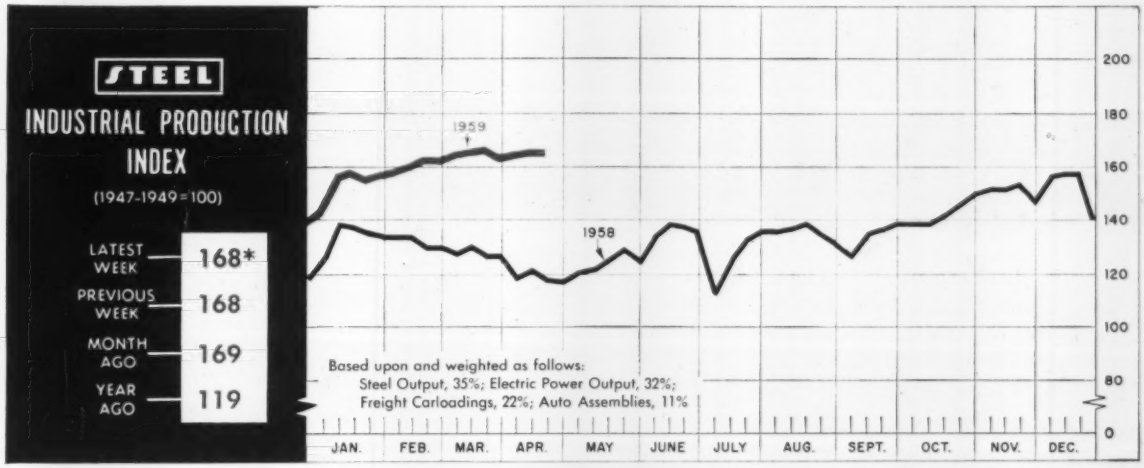
For your ring-shaped parts, save as other tool makers do. Specify Graph-Mo Hollow-Bar. It will save you time and money, give you better finished products. Sizes range from 2 to 16-inch O.D. Many wall thicknesses. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

WHEN YOU BUY TIMKEN STEEL YOU GET . . .

1. Quality that's uniform from heat to heat, bar to bar, order to order
2. Service from the experts in specialty steel
3. Over 40 years experience in solving tough steel problems

TIMKEN® *Fine Alloy* STEEL

"TIMKEN GRAPHITIC STEELS ARE CARRIED IN STOCK BY 9 DISTRIBUTORS WITH 42 WAREHOUSES IN 31 CITIES IN THE UNITED STATES AND CANADA"



*Week ended Apr. 18.

Production Plateaus at Record High

THE ZIP that characterized the industrial buildup in the first quarter has played out, leaving the general level of activity on the highest plane in history. It will stay there until the end of June.

STEEL's industrial production index has fluctuated within a range of only 2 points the last seven weeks (current reading: 168 per cent of 1947-49 average), and the chances of establishing any more records before the settlement of the steel wage contract are remote. The two factors which provided the main force in the first quarter climb—steel and automotive output—will sustain the index, but nothing more. Gains in freight carloadings may overcome seasonal losses in electrical output, but probably not enough to alter the course of the production trend line.

• **Chances for Steel**—Last week, the steel industry operated at 95 per cent of rated capacity. Under present conditions, that's about as high as it will go. To put the rate appreciably above 95 per cent would require use of uneconomical equipment and expensive overtime. Producers have resorted to such methods in the past but only when they could see sustained demand for all products for a comparatively long period.

Today, they know that a cutback is only two months away regardless of the outcome of wage negotiations. They might be tempted to push a little harder—maybe another point or two at the most—but operations at close to 100 per cent of capacity are not called for now. If demand for plates and other heavy products were as strong as that for sheets and strip, the story might be different.

• **Autos at Top** — Auto producers took heart from sales figures for March and early April and decided to maintain production at, or slightly above, first quarter levels. For the first time in several years, the

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,683[1]	2,657	1,270
Electric Power Distributed (million kw-hr)	12,500[1]	12,604	11,107
Bituminous Coal Output (1,000 tons)	7,960[1]	6,835	7,061
Crude Oil Production (daily avg—1,000 bbl)	7,150[1]	7,127	6,251
Construction Volume (*ENR*—millions)	$371.3	$469.8	$304.5
Auto, Truck Output, U. S., Canada (*Ward's*)	171,508[1]	169,157	98,885
TRADE			
Freight Carloadings (1,000 Cars)	625[1]	618	534
Business Failures (Dun & Bradstreet)	337	284	342
Currency in Circulation (millions)[3]	$31,365	$31,280	$30,733
Dept. Store Sales (changes from year ago)[3]	+18%	−13%	−16%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$24,321	$24,171	$24,260
Federal Gross Debt (billions)	$285.7	$285.8	$272.2
Bond Volume, NYSE (millions)	$32.3	$31.2	$30.4
Stocks Sales, NYSE (thousands of shares)	17.8	15.6	12.2
Loans and Investments (billions)[4]	$95.2	$95.5	$89.8
U. S. Govt. Obligations Held (billions)[4]	$30.4	$30.5	$28.1
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	220.5	219.2	196.2
All Commodities[7]	119.9	119.7	119.5
Commodities Other than Farm & Foods[7]	128.1	128.2	125.7

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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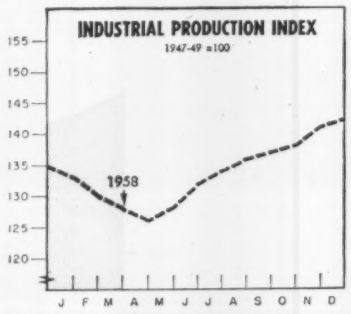
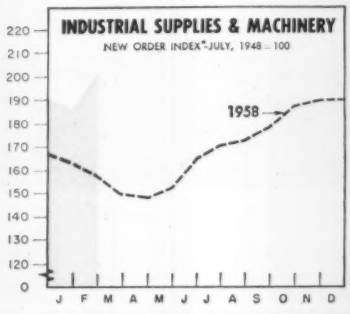
THE BUSINESS TREND





(Seasonally adjusted)

	Total Production 1959	1958	Primary Metals 1959	1958	Metal Fabricating 1959	1958
Jan.	143	133	125	100	166	159
Feb.	145	130	138	95	168	153
Mar.	147*	128	146*	91	170*	150
Apr.	...	126	...	86	...	146
May	...	128	...	91	...	148
June	...	132	...	103	...	151
July	...	134	...	102	...	154
Aug.	...	136	...	109	...	156
Sept.	...	137	...	113	...	155
Oct.	...	138	...	123	...	155
Nov.	...	141	...	123	...	163
Dec.	...	142	...	123	...	165
Avg.	...	134	...	105	...	155

Federal Reserve Board. *Preliminary.
Charts copyright, 1959, STEEL.

(Seasonally adjusted)

Jan.	186	163	221	190
Feb.	202	157	219	190
Mar.	...	149	210	190
Apr.	...	148	203	195
May	...	152	199	199
June	...	164	199	197
July	...	170	197	203
Aug.	...	172	197	211
Sept.	...	178	203	203
Oct.	...	187	192	206
Nov.	...	189	180	220
Dec.	...	190	167	218

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.

historical spring upturn in sales seems to be taking hold. *Ward's Automotive Reports* says the first ten-day selling period of April was the best initial period in about 18 months. Dealers marketed an average of 18,100 cars a day vs. 16,660 in the corresponding period of March. And March turned out to be a bonanza.

It is doubtful that the industry will step up its production of cars and trucks much above the current 160,000-a-week mark. It may even cut back a bit in May. Stocks are in good condition, and at the current selling rate, production is still higher than retail deliveries.

There is little inclination to build inventories higher as a hedge against a steel shortage during the summer because auto producers are in good shape on steel stocks through the end of the '59 model run.

• **Carloadings Building**—Since the beginning of the year, there has been a slow but persistent buildup in loadings of railroad freight cars. The pace is about to quicken. If there is any chance of a record for STEEL's production index in the next two months, it will be because of this factor.

Within the next month to six weeks, loadings should increase by about 80,000 to 100,000 cars a week. Main reason: The opening of the navigation season on the Great Lakes. Steelmakers are anxious to get iron ore down from upper lakes ports, which so far have been blocked by the worst ice in years. A few ships have started out under Coast Guard escort, but it may be well into next month before activity is normal.

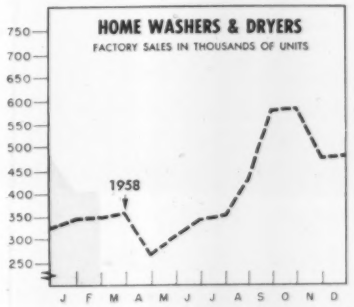
But shipments of coal and metalworking products are on the increase. Perhaps they are a more accurate gage of industrial activity. Miscellaneous shipments, which include most of metalworking's rail freight, are almost 67,000 cars ahead where they were a year ago.

• **Power Off Seasonally**—The only factor depressing the index at the moment is output of electric power, which is in a seasonal decline. If this industry follows historical patterns, the bottom of the curve should be reached in early May, followed by a gradual upturn until the use of commercial, residential, and industrial air conditioning equipment brings a swift rise.

Despite the rapid upturn in the economy in general, the trend line for this industry has not shown

	1959	1958	1957	1956
Jan.	115.84	93.07	126.34	122.43
Feb.	124.77	93.49	139.29	129.56
Mar.	....	97.89	140.76	166.14
Apr.	....	122.36	132.67	145.20
May	....	118.04	157.95	155.53
June	....	131.15	121.57	189.13
July	....	134.34	128.31	165.50
Aug.	....	104.46	110.09	168.70
Sept.	....	85.41	116.79	130.35
Oct.	....	111.35	124.80	143.38
Nov.	....	110.88	87.80	138.50
Dec.	....	105.97	105.65	117.76
Avg.	....	109.87	124.34	147.68

Material Handling Institute Inc.



	Washers 1959	Washers 1958	Dryers 1959	Dryers 1958
Jan.	288,491	244,840	118,220	100,793
Feb.	297,826	268,143	106,274	79,683
Mar.	.....	287,884	.....	71,523
Apr.	.....	224,896	.....	38,475
May	.....	262,999	.....	41,898
June	.....	288,831	.....	54,173
July	.....	277,287	.....	75,513
Aug.	.....	326,785	.....	109,833
Sept.	.....	423,073	.....	158,733
Oct.	.....	404,056	.....	180,405
Nov.	.....	333,035	.....	142,499
Dec.	.....	330,520	.....	148,670
Totals	.....	3,672,349	.....	1,202,198

American Home Laundry Mfrs. Assn.

any unusual strength. But it is still about 11 or 12 per cent ahead of year-ago readings and should increase as summer approaches.

• **Maximum Demand** — Today's general business level corresponds roughly with that of about two years ago—the mix is different, but the over-all effect is the same. But in 1955-56 an index reading of 168 represented the nation's practical ceiling to produce goods. Today, that reading seems to indicate nothing more than the ceiling for present demand.

With the exception of the steel industry, most industries have quite a way to go before reaching capacity. They are not likely to close the gap until well after the major labor contracts coming up for negotiation this summer are settled. But by the fourth quarter, records set in early 1959 will be just stepping stones to new ones.

FRB Index May Climb

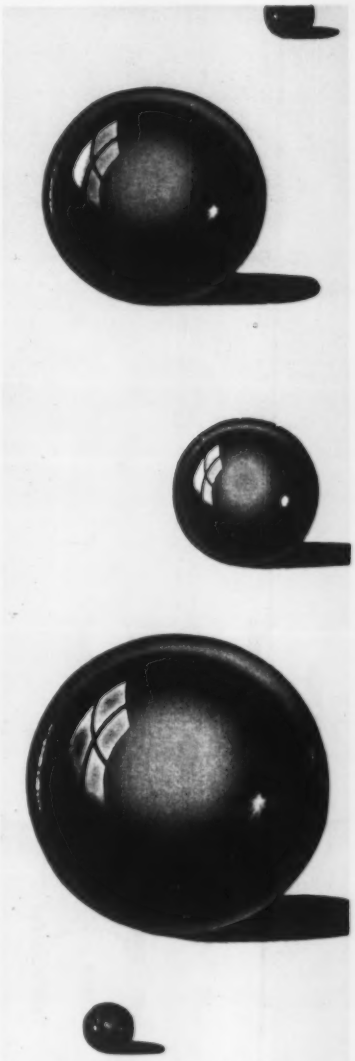
It does not mean that the Federal Reserve Board's index will begin to decline, or even level off. Being seasonally adjusted, it probably will continue to rise through June. It hit a new high in March (see graph, Page 76) at a preliminary 147 (1947-49 = 100), besting the old mark by 1 point.

The patterns of shipments and new orders in the durable goods sector of the economy indicate that metalworking as a whole will continue to show a gradual uptrend through the early summer months, adding strength to the FRB index figure. A high point of 150 (seasonally adjusted) by June is possible.

Sees Effects of Strike

But what about after July 1—especially if there is a steel strike? James Dawson, vice president and economist of Cleveland's National City Bank, feels the experiences during and after the strikes in 1949, 1952, and 1956 indicate a continuation of high level activity in most other sectors of the economy. He points out that during those work stoppages industrial production declined only about 3 per cent. The recovery to levels above prestrike months was quick.

Personal income and retail sales suffered even less than production. Income dropped about 1 per cent, while retail sales held steady during the strikes and dipped nominally a month or two later.



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OR36

HAROLD I. MARTIN
Swindell-Dressler president

GEORGE H. FROMER
Atlas Drop Forge v. p.

FRANK B. WOLCOTT
Sawhill Tubular exec. v. p.

FRED M. ZEDER II
Hydrometals president

Harold I. Martin was named president, **Swindell-Dressler Corp.**, Aspinwall, Pa. He has been in charge of design and construction of engineering projects. Mr. Martin succeeds **William H. Cosgrove**, now chairman, remaining as chief executive officer. **Samuel B. Casey Sr.**, former chairman, is now chairman of the finance committee. Other changes: **Philip Dressler**, executive vice president; **Hugh J. Pugsley**, senior vice president.

George H. Fromer was appointed vice president and general manager, **Atlas Drop Forge Co.**, subsidiary of Dana Corp. at Lansing, Mich. He formerly was general manager, Taylor Forge & Pipe Works, Gary, Ind.

Stuart R. Ives, president of **Armco Drainage & Metal Products Inc.**, Middletown, Ohio, subsidiary of Armco Steel Corp., retires May 1. He will be succeeded by **W. O. Robertson**, vice president-sales. **Warren S. Mann**, vice president and manager of the Dixie Div. in Atlanta, will assume Mr. Robertson's post. **L. L. Williams** will replace Mr. Mann in Atlanta. **M. C. Patton**, now executive vice president, becomes chairman.

Jay P. Sellick was appointed assistant vice president, **United Aircraft Products Inc.**, Dayton, Ohio.

Christian W. Rudolph was named purchasing agent for the Philadelphia branch of **Disston Div.**, H. K. Porter Company Inc. He succeeds **Millan Shevchik**, who was appointed to head the new Disston plant under construction in Danville, Va.

Frank B. Wolcott was appointed executive vice president, **Sawhill Tubular Products Inc.**, Sharon, Pa. He was with Wyandotte Chemicals Corp. where he successively held posts of vice president-manufacturing, and vice president and general manager, Research & Engineering Div.

H. Edward Ehlers and **Warren A. Zimmer**, vice presidents of **Joseph Dixon Crucible Co.**, Jersey City, N. J., were elected senior vice presidents. **Sherwood B. Seeley**, technical director, was promoted to vice president-research. Mr. Ehlers remains in charge of sales; Mr. Zimmer in charge of manufacturing.

Richard S. Reynolds Jr. was elected chairman of **Robertshaw - Fulton Controls Co.**, Richmond, Va. He replaces **John A. Robertshaw**, who will serve as vice chairman until retirement in June. Mr. Reynolds is president of Reynolds Metals Co.

Stuart A. Smith was made sales manager of furnaces by **Perfection Industries**, division of Hupp Corp., Cleveland. He was sales vice president of Waterman-Waterbury Co.

W. R. Jackson was elected president and chief administrative officer, **Pittsburgh-Des Moines Steel Co.**, Pittsburgh. **J. E. Jackson** was elected chairman of the board and chairman of the executive committee.

Lewis D. Fykse was appointed director of marketing for **Associated Spring Corp.**, Bristol, Conn. He was marketing services manager, American Machine & Foundry Co.

Fred M. Zeder II was elected president and chief executive officer of **Hydrometals Inc.**, Chicago (formerly Illinois Zinc Co.). **William M. Hayden** was named chairman. The posts were formerly held by **Morris Blumberg**, resigned. Mr. Zeder, who is president of Chrysler-Zeder Corp. (privately held electronics firm), was financial adviser and engineering consultant to the late **Jack F. Chrysler**. Mr. Hayden is president of Hayden Metals, a subsidiary of Hydrometals. He was founder and first president of Chemetals Corp., and formerly head of industrial research for Anaconda Co.

Cyrus C. Haynie was named assistant to the plant manager, San Diego, Calif., **Solar Aircraft Co.**

Richard B. Courchene succeeds **P. J. Watry**, retired, as president, **Meta-Mold Aluminum Co.**, Cedarburg, Wis., subsidiary of Dayton Malleable Iron Co. He remains in Dayton, Ohio, and continues as vice president and industrial relations director of the parent company.

J. O. Phillips, assistant manager, was promoted to manager of forging and die steel sales for **Heppenstall Co.**, Pittsburgh. He succeeds **George H. Wurster**, who now heads the Pittsburgh district sales office for Heppenstall, and Midvale-Heppenstall Co., subsidiary.

Al Bell was made sales manager at **Lincoln Rebuilders**, Cleveland. He is responsible for sales of machine tools rebuilt by Lincoln, and will also help in introducing the com-

J. R. PHILIPS JR. ARTHUR A. KAPPENHAGEN
general superintendents of Republic plants

EUGENE P. BERG T. WEBSTER MATCHETT
operation managers of Link-Belt plants

pany's new contract millwright service for northeastern Ohio.

J. R. Philips Jr. was appointed to the new post of general superintendent at **Republic Steel Corp.'s** Youngstown steel plant. **Arthur A. Kappenhagen** fills the new post of general superintendent at the Chicago steel plant. Mr. Philips was manager of the Youngstown plant's Order & Shipping Dept. and is replaced by **E. M. Bulla**, former assistant manager, Order Dept. **E. R. Ramsey** replaces Mr. Bulla. Mr. Kappenhagen was division superintendent-steel plant at Youngstown.

James R. McIlroy was elected president, **Pittsburgh Pipe & Coupling Co.**, Allison Park, Pa. He succeeds **James M. Lamond**, now chairman. Mr. McIlroy was vice president and secretary. **Peter McIlroy**, former chairman, was elected chairman of the executive committee. **M. E. Meese** was elected secretary-treasurer.

Maj. Gen. T. C. Odom (USAF, ret.) was appointed director of systems management for the Military Products Div., **International Business Machines Corp.**, New York.

Fred L. Chapman, vice president-sales, Gisholt Machine Co., Madison, Wis., retired after 30 years with the company. **Harvey A. Waddell**, treasurer, assumes added duties as secretary.

Edward D. Wilgus was appointed vice president - sales manager, **Olympic Screw & Rivet Corp.**, Downey, Calif. He had served in an executive capacity with Aviation Developments Inc.

Eugene P. Berg was made general manager-Chicago operations, **Link-Belt Co.**, which consist of the Pershing Road and Caldwell plants. He was general manager of the Pershing Road plant. **T. Webster Matchett** was made manager, Caldwell plant, to succeed **G. Walter Ostrand**, retired.

Stewart H. Steffey was appointed manager, slag products section, **United States Steel Corp.**, Pittsburgh. He succeeds **W. Kenneth Dorman**, who was transferred to stainless steel sales. Mr. Steffey formerly served at Philadelphia as assistant to the sales manager in U. S. Steel's sales office.

Milton Shapiro was named manager of the new Market Research Dept. of **Vickers Inc.**, Detroit, division of Sperry Rand Corp. He was market research and advertising manager, Waterbury Tool Div., Vickers Inc., from 1952 to 1957. Since then he has been market research manager, Machinery Hydraulics Div.

Edgar W. Kimmell joined **Penn Machine Co.**, Pittsburgh, as assistant to the vice president and treasurer.

Russell G. Heyl Jr. was made chief engineer-research and development for **American Metal Products Co.**, Detroit. **John Hern** was made assistant chief engineer-body components; **Paul Thomas**, assistant chief engineer-chassis components and nonautomotive products.

Penn Metal Co. Inc., Boston, appointed **Daniel V. Reddington** manager, Steel Movable Partitions Dept., Parkersburg, W. Va. New district managers are: **John F. Hamilton**, Detroit; **Harold Jennings**, St. Louis; **Ralph L. Leaf**, Chicago.

William S. Loose was made manager, Metal Sales Dept., **Dow Chemical Co.**, Midland, Mich. He was sales manager for all Dow magnesium products and is succeeded by **Donald H. Gilmore**, former manager of the company's Pittsburgh sales office.

Robert R. Owen was made marketing manager - electromechanical products, **Consolidated Electrodynamics Corp.**, Pasadena, Calif.

M. B. Garber, vice president, **Thew Shovel Co.**, Lorain, Ohio, retired after 32 years with the company.

Robert V. Hansen was named marketing manager-vending machine controls for **Controls Co. of America**, Schiller Park, Ill. He was national sales manager, Vending Div., Norris Dispensers Inc.

Stephen Kakish was named director of purchases, **Roll Formed Products Co.**, and **Hynes Steel Products Co.**, Youngstown. **James P. Hyland** was named controller.

Charles D. Preusch was appointed materials and process engineer, **Crucible Steel Co. of America**, Pittsburgh. He was chief metallurgist at the Spaulding Works in Harrison, N. J.

Donald H. Klein joined **McLaughlin Co.**, Birmingham, Mich., as sales manager. He was with Mt. Clemens Metal Products Co.

Stanley E. Beauregard, sales engineer, joined the sales staff of **R. O. Hull & Co. Inc.** He operates from

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WAYNE H. McGLADE
Le Tourneau-Westinghouse post

FRED A. COENEN
Chain Belt p. a.

LEE J. GILLETT
Kaiser Eng. purchasing dir.

ANDREW H. LEINGANG
East Dayton Tool v. p.

HOWARD K. NORRIS
U. S. Rubber production post

the Detroit office and serves eastern Michigan industries.

Lee J. Gillett, former procurement manager for **Kaiser Engineers**, Oakland, Calif., division of Henry J. Kaiser Co., was appointed director of purchases. He succeeds **J. H. Rowan**, who has assumed a consulting position as director of special purchases for the firm.

Hugh S. Ferguson, effective May 1, will succeed **Richard S. Morse** as president of **National Research Corp.**, Cambridge, Mass. Mr. Ferguson was executive vice president in charge of the chemical group at W. R. Grace & Co. He had previously served as president of Dewey & Almy Chemical Co. until its merger with Grace. Mr. Morse assumes new duties June 1 as director of research and development for the U. S. Army.

L. R. Jeffrey Jr. was elected president and general manager, **National Ultrasonic Corp.**, Irvington, N. J. He was vice president of Alcar Instruments Inc.

Andrew H. Leingang was elected vice president-manufacturing, and sales director of **East Dayton Tool & Die Co.**, Dayton, Ohio. Former sales manager, he is succeeded by **Robert A. Leingang**, former assistant sales manager. **Clifton C. Hawkins Jr.** was elected treasurer.

Howard K. Norris was named production manager, Mechanical Goods Div., **United States Rubber Co.**, New York. He succeeds **W. A. Armstrong**, retired. Mr. Norris was factory manager at the Gilmer plant, Philadelphia.

F. J. Littell Machine Co., Chicago, appointed **Charles F. Netzler** assistant sales manager.

R. Milham was made manager of international sales, **Foxboro Co.**, Foxboro, Mass. **G. H. Gleason** will assist with international operations.

Dale J. Richards was appointed assistant sales manager, **Beryllium Corp.**, Reading, Pa. He was Detroit manager, warehouse and sales territory.

Robert G. Carlson was made manager, Hi-Pressure Products Div., **Sargeant & Wilbur Inc.**, Pawtucket, R. I. He was project engineer in charge of establishing major production facilities for M & C Nuclear Inc. in Attleboro, Mass.

Wayne H. McGlade was named product development manager-earth-moving and related equipment for **LeTourneau-Westinghouse Co.**, Peoria, Ill. He was assistant to the executive vice president. In his new post, Mr. McGlade succeeds **E. W. Spannhake**, resigned.

Fred A. Coenen was appointed purchasing agent for the Milwaukee operations of **Chain Belt Co.**, succeeding the late **Charles B. Johnson.** Mr. Coenen was made assistant purchasing agent in January.

Richard C. Tonner was made manufacturing superintendent of **Sylvania Electric Products Inc.'s** semiconductor plant at Woburn, Mass. **Jerry D. Hix** fills the new post of metallurgical product sales manager, Chemical & Metallurgical Div., at Towanda, Pa.

Walter R. Ebling was appointed market and product analyst, Metallurgical Products Dept., **General Electric Co.**, Detroit.

OBITUARIES...

C. Donald Dallas, 77, former chairman, **Revere Copper & Brass Inc.**, died Apr. 11 in Sarasota, Fla.

Rex McC. Baker, superintendent of the Open Hearth Dept., Sparrows Point, Md., steel plant, **Bethlehem Steel Co.**, died Apr. 6.

Joseph J. Morsman Sr., a former vice president, **National Lead Co.**, died in Chicago Apr. 1.

Meredith Spear, 51, production manager at **AC Spark Plug Div.**, Milwaukee, General Motors Corp., died Apr. 14.

Morris Miller, 63, chairman, **Miller Compressing Co.**, Milwaukee, died Mar. 30.

Herbert W. Hansen, 54, eastern sales manager, **Producto Machine Co.**, died in Bridgeport, Conn., Apr. 9.

Furnace at Jones & Laughlin's new Basic Oxygen Steel Making Plant

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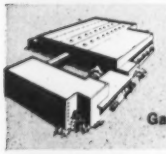
- H-W OXIMIX is the basic ramming mix which forms both the monolithic hearth of the furnace and the intermediate monolith between the H-W 17-56 working lining and the H-W MAGNESITE brick.



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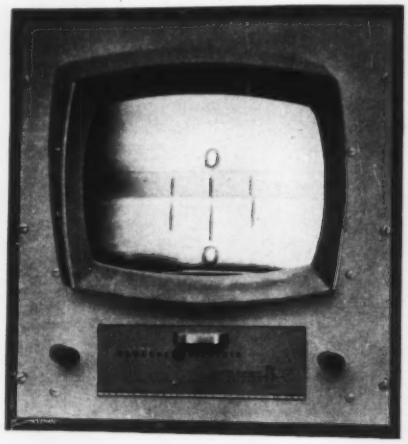
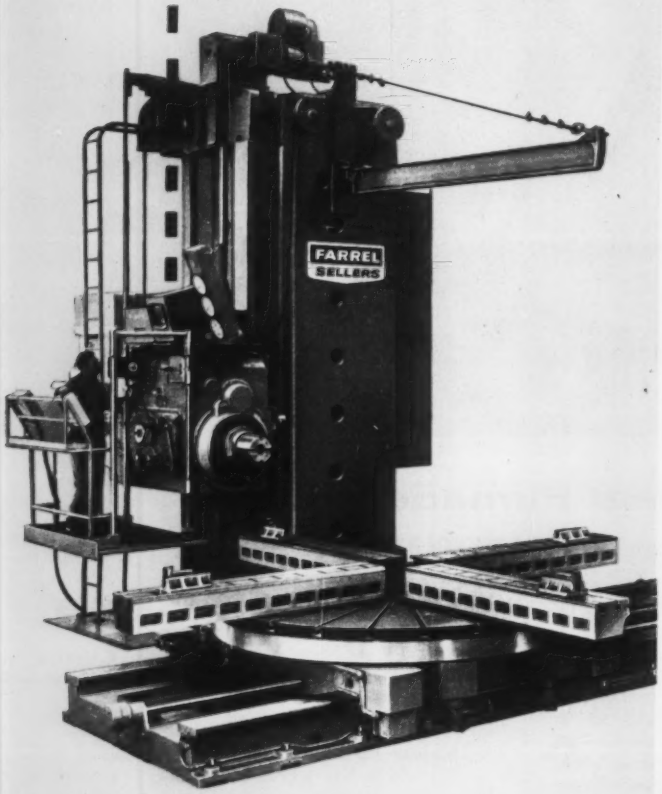


From a television monitor, mounted on the spindle head, the operator receives a clear picture of the table index band and pointer. Thus, table index position can be seen at a glance.

What's more, the operator can choose from 24 different index bands by raising or lowering the camera (see photo below). A square end shaft, with dial calibrated to correspond to the index bands, automatically focuses on the desired band.

Because this horizontal machine and rotary table can bore, drill, tap and mill as well as position and index the work — it is one of the most profitable investments you can make. Further details and specifications are available upon request.

Also available are standard floor and planer-type horizontal boring mills, from 8" and up, as well as special mills and attachments to meet individual requirements.

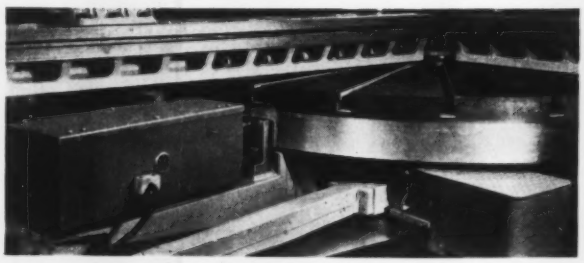


FARREL-SELLERS 10" horizontal boring mill incorporates a device for readout measuring of vertical head-travel in thousandths of an inch.

FARREL-BIRMINGHAM COMPANY, INC.
CONSOLIDATED MACHINE TOOL DIVISION
565 Blossom Road, Rochester 10, N. Y.
Telephone: BUtler 8-4600
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.

FARREL SELLERS

Television camera, mounted adjacent to the rotating table, relays index band settings to the monitor on the spindle head.



CM-43

U. S. Steel Lifts Efficiency With New Sintering Plant

U. S. STEEL CORP., Pittsburgh, is operating a sintering plant for the beneficiation of iron ore fines at its South Works, South Chicago, Ill. The 5000-ton-per-day facility took about two years to build.

Fine powdered ore mixed with coke is fed through the sintering plant where it's fused by heat into clinkerlike chunks of uniform size. The processed ore increases the efficiency of blast furnaces and boosts their ironmaking capacity.

The ore is too fine to be used economically without such processing. Most of it would be lost in the form of dust from the stacks.

• **Plant Components** — The plant was designed and built by the Dwight-Lloyd Div., McDowell Co. Inc., Cleveland. It consists principally of four parts: A continuous traveling sintering grate 168 ft long and 8 ft wide; a special gas-fired furnace to ignite the fuel contained in the mixture of iron and coke breeze; a series of wind boxes to accelerate the fusing of iron particles; and fans with a capacity of 390,000 cfm.

Other handling equipment includes 8570 ft of heavy duty conveyor belts for transporting materials and a cooler conveyor where material passing under cooling hoods is reduced from 1100° F to about 250° F in 300 ft.

Charles J. Hunter, general superintendent of South Works, says the sintering plant is a major step in the mill's modernization program. He says it will contribute greatly to the conservation of raw materials and will support South Works's competitive position in the steel industry.

Simpson Buys Building

Simpson Electric Co., a division of American Gage & Machine Co., Chicago, purchased the Case Co. building in Elgin, Ill., for gradual expansion in that area. For the present, Elgin American Inc. will continue its operations in the building which contains 250,000 sq ft of office and production space. Simpson makes radio and television test equipment, aircraft instruments, ammeters and volt meters, laboratory test equipment, and automotive test equipment.

Victor Metals to Build

Victor Metals Products Co., Greenwich, Conn., plans to build a plant in Harrisonburg, Va., to make metal tubes, cans, and other containers.

Dravo Leases Equipment

Dravo Corp., Pittsburgh, is offering a leasing plan for its line of industrial and commercial space heaters and other equipment. The plan, operated in conjunction with the United States Leasing Corp., San Francisco, makes it possible for business firms to acquire needed equipment for base lease periods, freeing working capital for other use.

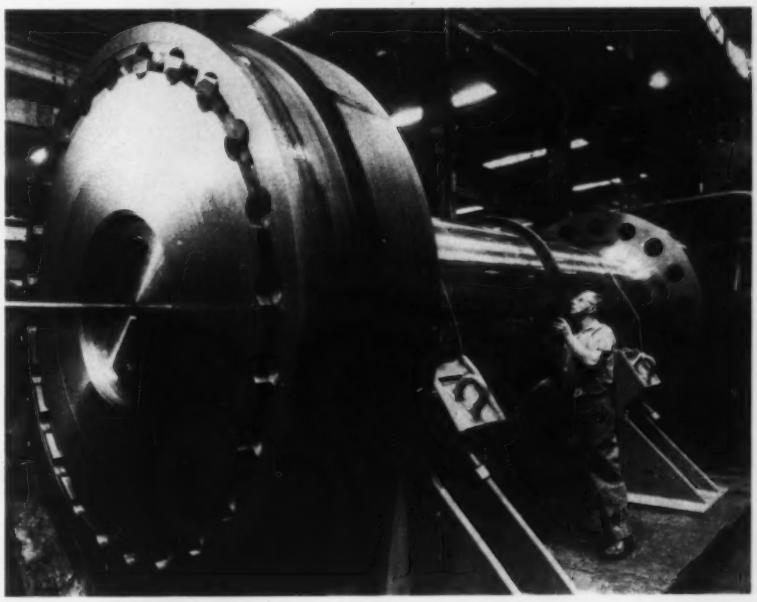
Foundry Changes Hands

A new Wisconsin corporation, Federal Malleable Co. Inc., has taken over and is continuing the operations of Federal Malleable Co., Allis, Wis. Officers of the new organization are: President, N. N. Amrhein; vice president-sales, F. J. Huwiler; vice president and treasurer, T. F. Slattery; and assistant treasurer, C. A. Stegemeyer.

Gabriel to Build Plant

Gabriel Co., Cleveland, will build a plant on a 450 acre tract near the Mesa, Ariz., facilities of Talco Engineering Co., a wholly owned subsidiary. It will produce solid fuel for moderate thrust rockets and missiles. C. E. Bartley has been named president of Rocket Power Inc., a wholly owned subsidiary recently organized to operate the solid fuel

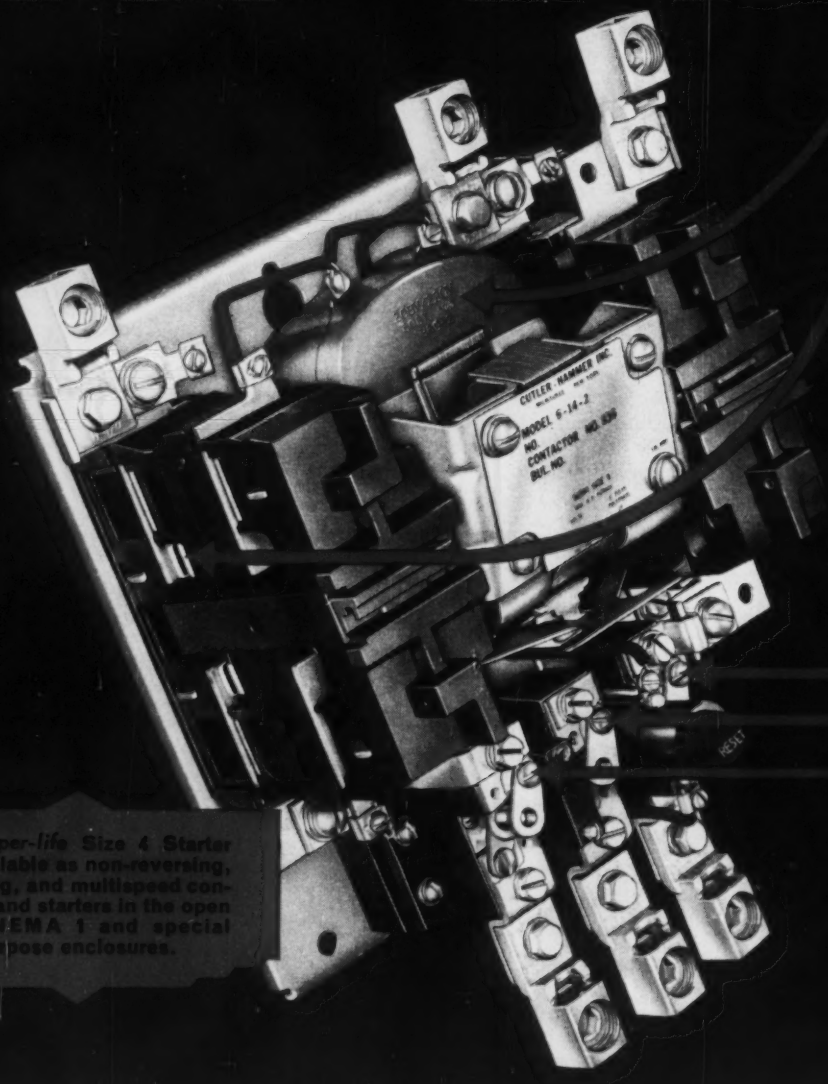
(*Please turn to Page* 88)



THIS 50-TON SHAFT with a shank diameter of 50 in. will be shipped to Lewiston, N. Y., when operations on the 96 in. engine lathe are completed at the East Pittsburgh, Pa., plant of Westinghouse Electric Corp. Lewiston is the site of the $720 million New York State Authority's Niagara power project. It will have a maximum installed capacity of 1,950,000 kw at the main generating plant. Westinghouse will ship the last of 13 waterwheel generators early in 1961

YOU CAN PROVE

Cutler-Hammer Motor Control works better . . . lasts longer



New super-life Size 4 Starter . . . available as non-reversing, reversing, and multispeed contactors and starters in the open type, NEMA 1 and special purpose enclosures.

CUTLER-HAMMER

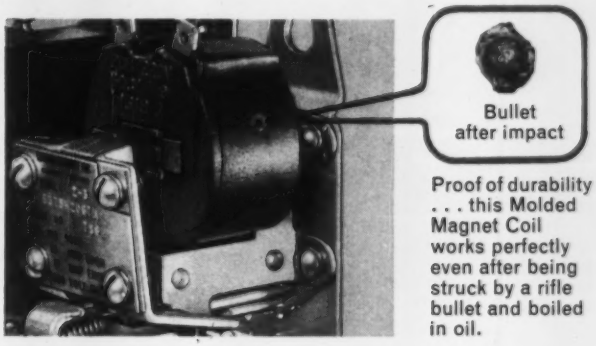
CUTLER-HAMMER CONTROL CH

Cutler-Hammer Inc., Milwaukee, Wis. • *Division:* **Airborne Instruments Laboratory.** • *Subsidiary:* **Cutler-Hammer International, C. A.**

Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation.

MOLDED MAGNET COILS

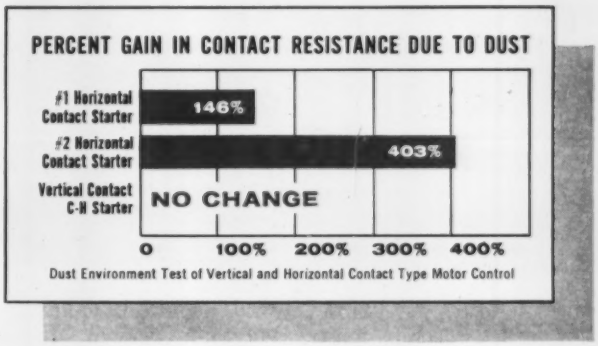
The strength and durability of the Cutler-Hammer Molded Magnet Coil is but one example of how Cutler-Hammer Motor Control is built better to last longer. Rifle bullets couldn't pierce or shatter this coil. What chance is there of it being damaged when an electrician's screwdriver slips or when the coil is dropped? Boiling oil has no effect on this coil. What chance is there of it ever being penetrated by moisture or distorted by high ambient temperatures?



Proof of durability . . . this Molded Magnet Coil works perfectly even after being struck by a rifle bullet and boiled in oil.

VERTICAL DUST-SAFE CONTACTS

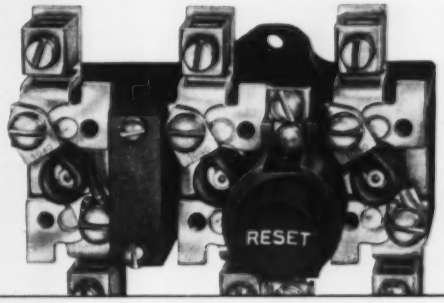
To function properly motor control contacts *must* stay clean. And because dust can't collect on a vertical surface, only vertical contacts are truly *dust-safe*. Recent dust-chamber tests of vertical and horizontal contact type motor starters confirm this fact. After four hours of "dusting," the contact resistance of Cutler-Hammer vertical contacts remained constant. But the contact resistance of horizontal contacts skyrocketed, and as contact resistance increases so does heating, pitting, and wear resulting in rapid contact failure.

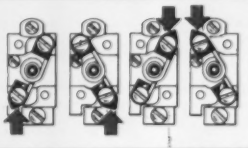


Dust Environment Test of Vertical and Horizontal Contact Type Motor Control

ADJUSTABLE 3-COIL OVERLOAD RELAYS

Only 3-coil overload relays can provide dependable overload protection for three-phase motors under all operating conditions. Why gamble with costly motor burnouts by using motor control that protects only two of the three motor windings? 3-coil overload relays can be provided in all standard Cutler-Hammer Motor Control, no oversize enclosures, or as an open component for low cost panel mounting. Further, Cutler-Hammer Overload Relays are adjustable to within 3% of full load motor current, not 10% or 12% as others. Cutler-Hammer Overload Relays allow the motor to work up to full capacity, provide positive protection without nuisance tripping.

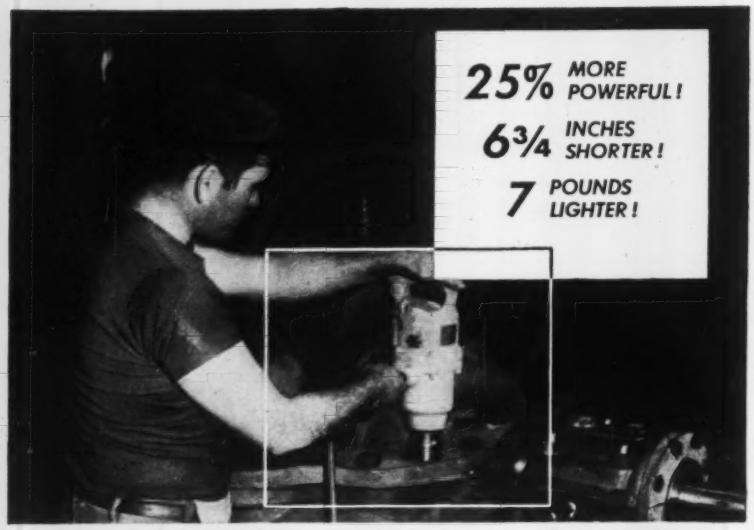




Heater coils can be placed in any of the four positions to adjust the overload trip point to within 3% of full load current.

Molded magnet coils, vertical *dust-safe* contacts, and adjustable 3-coil overload relays are *plus* features that add up to bonus performance wherever Cutler-Hammer Control is used. Why settle for less when Cutler-Hammer Motor Control costs no more. Write today for Pub. EN150-H213 Cutler-Hammer Inc., Milwaukee 1, Wisconsin.

NEW SIZE 834
IMPACTOOL
(1¼" capacity)



for faster run-down and easier handling in the tight spots . . .

Completely new design and construction of I-R's Size 834 Reversible IMPACTOOL gives you the most powerful, yet easiest-to-handle tool for any nut-running job.

New, compact, vane-type motor with direct drive to hammer provides greater torque and five times faster run-down, without transmitting kick or twist to operator. Small size and light weight make the 834 easy to use in tight, awkward positions. Yet rugged construction and strong alloy housing assure long maintenance-free tool life and efficient operation on even the toughest jobs.

Optional equipment includes Spline Drive Anvil, Swivel Inlet Assembly, Inside Trigger Handle, Side Spade Handle, and Extended Anvils.

$1,250 DIVIDEND DOLLARS
In terms of a *Dividend on Payroll Dollars*, the new I-R Size 834 can help you earn up to $1250 per operator, in one year. Ask your I-R representative for details.

FREE!

WRITE TODAY for Form 5248, describing the I-R 834 in detail. Includes in-use photos, specifications, standard and optional equipment, and accessories. Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand

Tools plus AIRengineering increase output per man

8-919

(*Concluded from Page 85*)

plant. Frank A. Marion is executive vice president. The first plant section and start-up costs will exceed $1 million.

Armco Building in West

Armco Drainage & Metal Products Inc. will make welded pipe in a $1.5 million plant it is building near Livermore, Calif. The plant will replace facilities in Berkeley, Calif., and will contain initially 135,000 sq ft of floor space. Operations will begin late this year. The firm is a subsidiary of Armco Steel Corp., Middletown, Ohio.

Opens Research Laboratory

Anaconda Wire & Cable Co., New York, opened its extra high voltage research laboratory at Hastings-on-Hudson, N. Y. The facilities cost more than $1,750,000.

Buys Machine Tool Line

Beatty Machine & Mfg. Co., Hammond, Ind., purchased the Quickwork line of machine tools from the Whiting Corp., Harvey, Ill. Included are stamping trimmers and rotary shears. Beatty produces presses, punches, shears, and bulldozers. John McGlone is sales manager for the Beatty-Quickwork Div.

Equipment Maker Expands

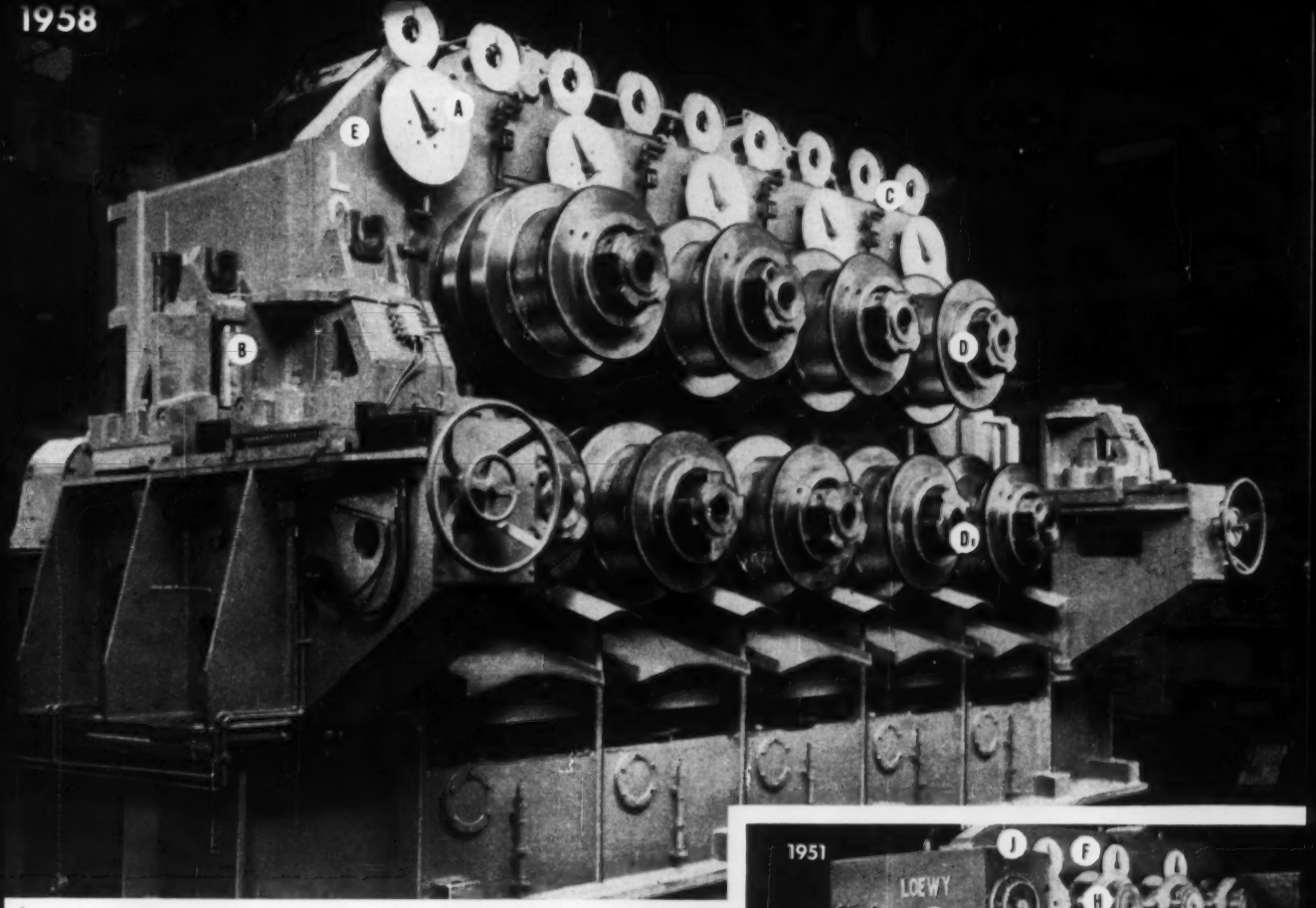
Badger Northland Inc., Kaukauna, Wis., is building a 30,000 sq ft plant addition. It will double the firm's capacity for producing farm and industrial equipment.

Dow Regroups Sales Units

Dow Chemical Co., Midland, Mich., has reorganized its magnesium sales organization into two separate groups. The Metal Sales Dept., under the managership of W. S. Loose, will specialize in primary metal, alloy ingots, and cast anodes. The Magnesium Products Sales Dept. will concentrate on sheets, extrusions, sand and diecastings, and fabricated products. It will be managed by D. H. Gilmore.

Donald K. Ballman, director of sales, says the company anticipates substantially larger quantities of

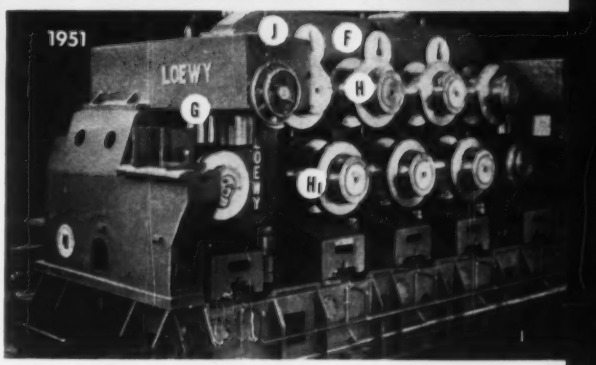
1958



A. Five indicators for vertical adjustment of horizontal rollers
B. Vertical rollers supported on both ends and arranged on base-mounted sliding frame
C. Nine indicators for lateral adjustment
D, D1. Horizontal rollers bench-assembled on sleeves for quick change of program
E. All-welded steel frame

Also noteworthy: lateral movements are power operated and vertical rolls are driven by separate motor

F. Three indicators for vertical adjustment of lower horizontal rollers
G. Vertical rollers overhung and mounted on overhung bracket
H, H1. Horizontal rollers directly mounted in roller shafts
J. Cast steel frame



Loewy roller-straighteners for structurals and rails feature one-pass straightening at 600 fpm

In 1951 Loewy-Hydropress designed and built America's first roller-straightener with overhung straightening rolls for heavy structurals and rails—the most important development ever made in the design of straightening machines. This one-man-operated Loewy-pioneered straightener beats the slow and cumbersome gag press, which depends entirely on the operator's skill. It outmodes the closed-type straightener, which is not nearly so accessible as the open-type Loewy, does not provide the horizontal adjustment for removing camber, and requires partial dismantling of the machine for every program change.

Now we offer a machine incorporating features that further improve on the original overhung model of 1951 (see photographs above). Among the advantages are greater maximum speed—up to 600 fpm—and decrease of time required for changing rolls. By providing sleeve-mounted rolls, their assembly may be accomplished away from the machine, and thus the change of rolls can today be effected with a minimum delay for different rolling programs. Roll adjustments are now remote-control power operated and provided with selsyn-actuated indicators which show the various adjustments in the operator's booth as well as on the machine. Our machines achieve better than commercial straightness in one pass.

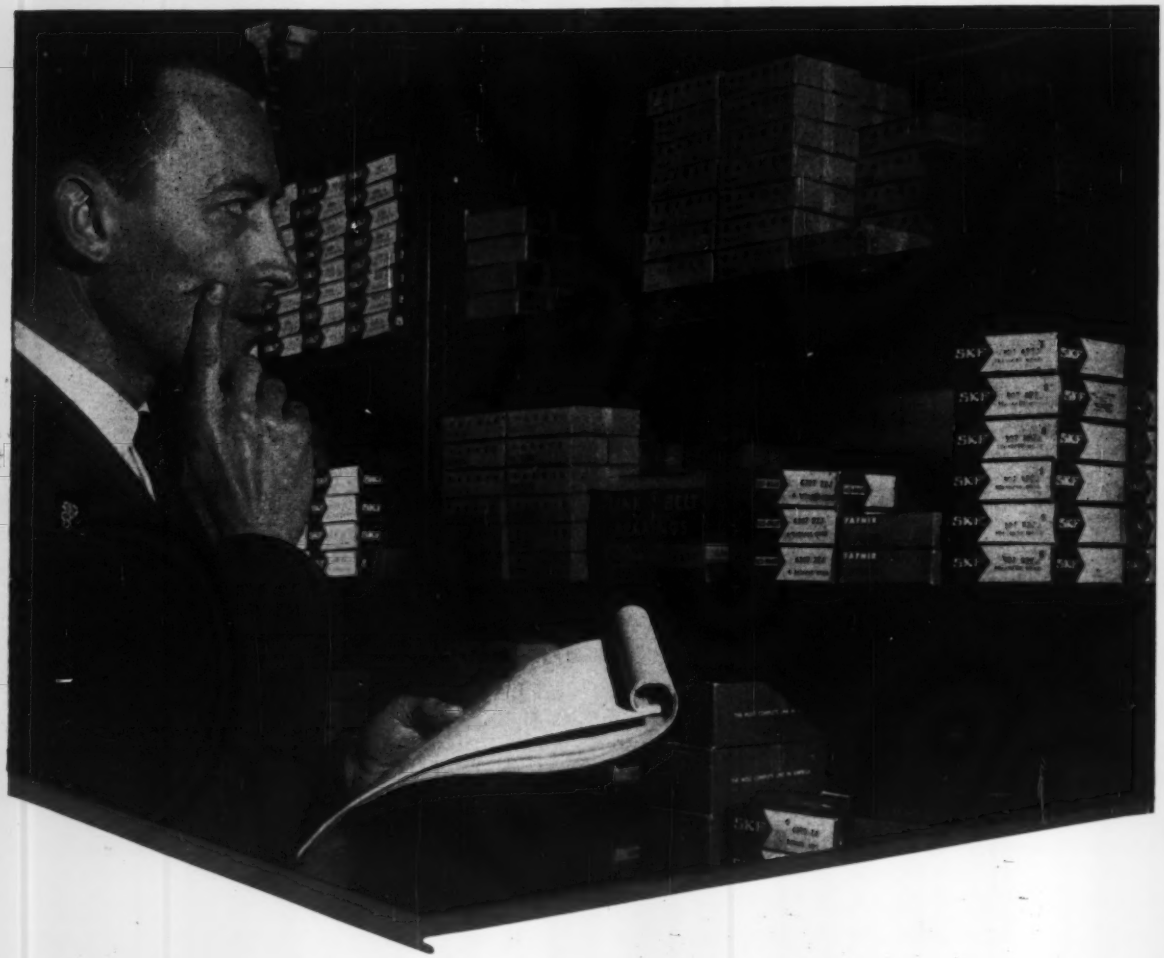
For more information on Loewy roller-straighteners for structural steel or on any other rolling equipment, write Dept B-4.

Loewy-Hydropress Division

BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN BLH LIMA-HAMILTON



Bearings, Inc. customers don't worry about inventory control . . .

They let us keep *their* worries in *our* stockroom. We make surveys of the immediate, as well as long range requirements for all bearings in their equipment. Those carried in their stock are fast-moving. Expensive precision bearings, specials and other bearings purchased infrequently are carried in the Bearings, Inc. branch — ready for instant delivery, day or night.

If a shortage develops or production is interrupted, our customers know the bearings they need are in our stocks. A phone call and the bearings required will be on the way. Our customers know the value of this important service.

If bearing inventories are worrying *you*, why not call the Bearings, Inc. branch nearest you for help.

Providing bearing service in the North ➤ **BEARINGS, INC.**

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute • **PENNSYLVANIA:** Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden
NEW YORK: Buffalo, Bolanrol Corp. • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington

and

in the South ➤ **DIXIE BEARINGS, INC.**

FLORIDA: Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge • New Orleans
N. CAROLINA: Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville

magnesium alloy ingots will be going to the automotive and appliance industries. The company also foresees expanded markets for magnesium wrought products and castings in aircraft, missiles, and consumer products.

Boosts Zirconium Output

Columbia-National Corp., Cambridge, Mass., is delivering reactor-grade zirconium metal to the U. S. Atomic Energy Commission and its reactor core builders at a rate greater than that called for by its AEC contract. The contract requires production of more than $22,750,000 worth of the rare metal over a five-year period. Columbia-National is owned by National Research Corp. and Columbia-Southern Chemical Corp. Its plant is near Pensacola, Fla., in Santa Rosa County.

Forms Consulting Firm

M. W. Isaacson has established a management consulting firm, the M. W. Isaacson Co., with offices at 95 Ruskin Rd., Eggertsville, N. Y., and 420 Lexington Ave., New York, N. Y. The firm will specialize in marketing and new product development in the metalworking industry.

Cleveland Firm Renamed

Cleveland Steam Gauge Co. changed its name to Cleveland Valve & Gauge Co. The address is 1700 Columbus Rd., Cleveland, Ohio.

National Lets Contracts

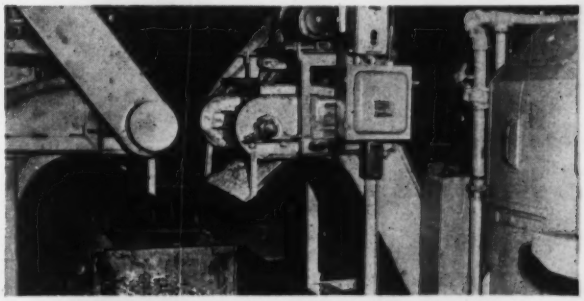
National Steel Corp., Pittsburgh, has awarded contracts for major facilities to be built under its $300 million expansion program (STEEL, Feb. 23, p. 47).

A contract for an 80 in., continuous, hot strip mill at Great Lakes Steel Corp., Detroit, has been awarded to United Engineering & Foundry Co., Pittsburgh. The mill will have an annual capacity of more than 3.6 million tons. It will be designed to roll slabs 30 ft long into coils weighing up to 1000 lb per inch of width.

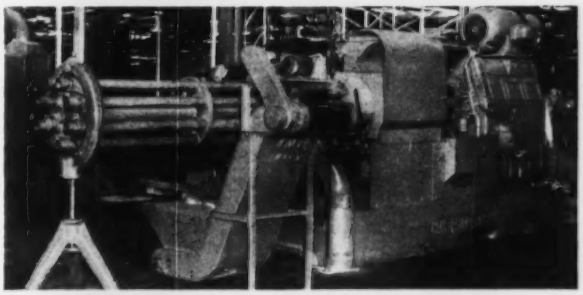
The 80 in. mill and 500,000 tons of annual ingot capacity being

(*Please turn to Page* 94)

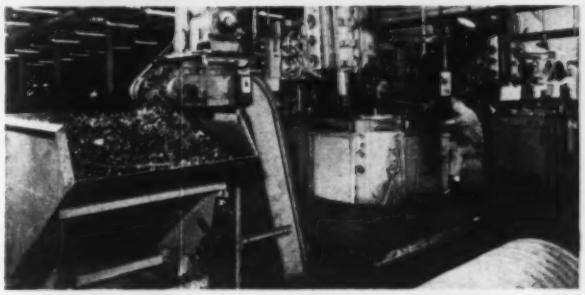
MAY-FRAN CHIP-TOTES



PROVIDE AUTOMATIC AND

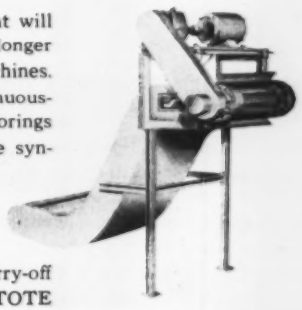


CONTINUOUS SCRAP REMOVAL



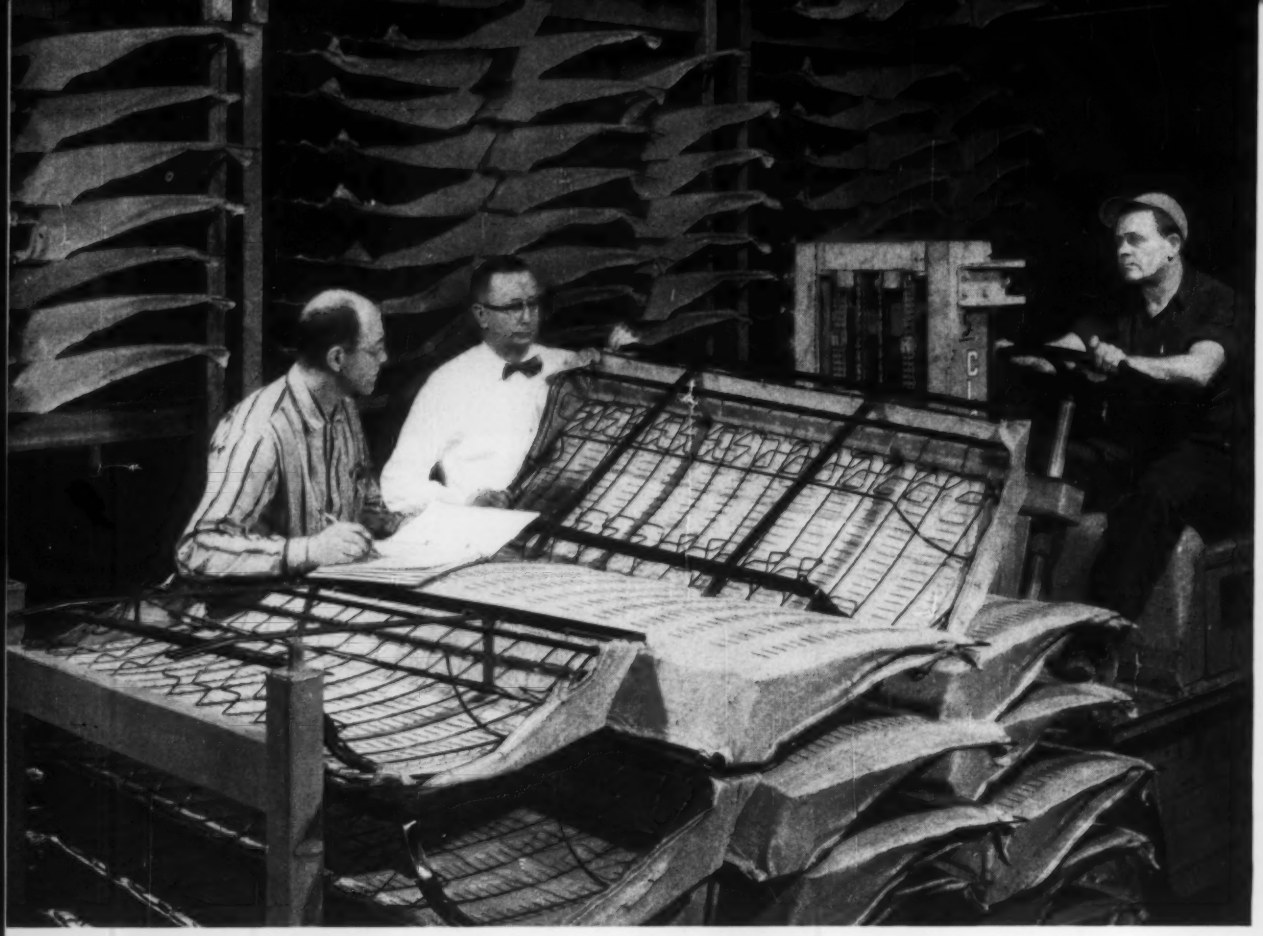
FROM ALMOST EVERY TYPE AND SIZE OF MACHINE TOOL

Here is a machine tool accessory that will cut production costs, and permit longer "run" times for your automatic machines. The MAY-FRAN CHIP-TOTE continuously removes the chips, turnings and borings from machines. The conveyor can be synchronized with the metal removing capacity of the machine. Scrap is channeled onto the CHIP-TOTE belt, carried clear of the machine for discharge into tote box or carry-off conveyor system. There is a CHIP-TOTE for every machine tool.



MAY-FRAN ENGINEERING, INC.
1725 Clarkstone Road, Cleveland 12, Ohio

For complete facts, write today and ask for MF-640.



Completed units await shipment at Reynolds Spring Co., Division of Stubnitz Greene Corp. Looking over seat backs are Plant Manager A. R. Kerr, on the right, and Basil Woodfork, foreman of assembly.

Tough Requirements For New Auto Seat Spring Met Easily With Pittsburgh Steel's Zig-Zag Wire

Stubnitz Greene Corp., Developer of Torflex Springs for 1959 Models, Likes Pittsburgh Steel Wire for Its Uniform Tensile Strength, Good Recovery

A new type of auto seat and back spring which returns economies to both spring maker and his auto producing customers is formed from Pittsburgh Steel Co.'s zig-zag wire because it meets requirements.

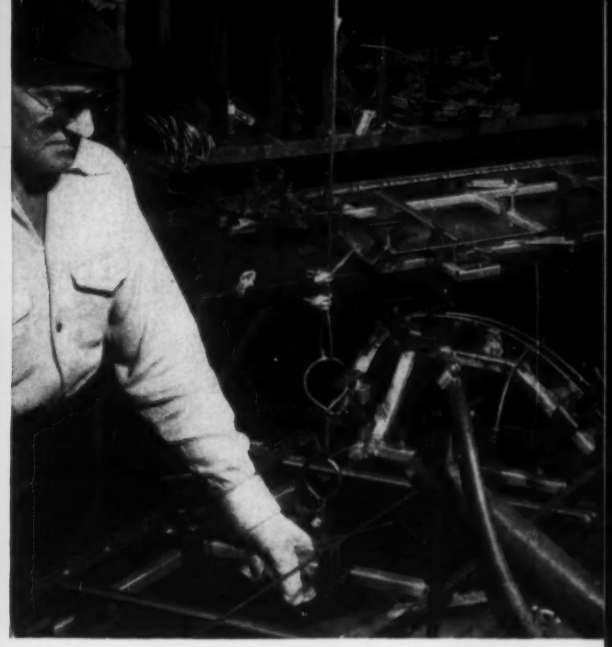
Top requirement for wire used in the new Torflex springs is just the right combination of tensile strength and formability. Pittsburgh Steel Co. is a major supplier because it provides that combination in every coil and in every shipment.

Torflex springs, designed by Stubnitz Greene engineers in 1958 and adopted for use in several 1959 automobile models, won favor because they cut production costs, are precision made for straight edges on finished seats, provide for good deflection ranges and eliminate pounds of dead weight.

"This new design calls for a high tensile zig-zag wire with a great deal of recovery," declared A. R. Kerr, plant manager of the Reynolds Spring Division in Vincennes, Ind. "We require zig-zag wire with a tensile strength of 230,000 pounds per inch and a yield point of 175,000 pounds. We must work within those points to do our forming. Pittsburgh Steel Co.'s wire meets our requirements for strength, formability and recovery."

• **11 gage typical**—The new Torflex spring is formed from Pittsburgh Steel's zig-zag wire in gages ranging from 8 to 12. A typical spring, made of 11-gage wire, measures 40.62 inches in length with a straight 19⅛-inch segment in the middle. This spring has six boxes (loops) at one end, plus a governor loop. On the other end, there are four boxes and a governor loop. Each

Forming Torflex springs from Pittsburgh Steel Co.'s zig-zag wire on forming machine. Here 11-gage MB zig-zag wire is being formed into a spring 40.62 inches long.



Spring elements and other component parts, made of basic wire, brace and border wire and steel strip, are assembled in jigs for spot welding.

box has a different width, from 1.68 inches to 2.38 inches.

"Uniform diameter is very important to us," said Plant Manager Kerr, "since it affects the formation of the boxes as well as their strength and performance. We have found Pittsburgh Steel's wire to be very good on diameter. It's drawn pretty much right on the nose. We've had no trouble."

Torflex springs also require wire free of piping which could cause fractures. Reliable tensiles give long production runs with Pittsburgh Steel wire.

At the Vincennes plant, Pittsburgh Steel's zig-zag wire is cut to length, then formed into springs on special machines designed by Stubnitz Greene engineers. Production per machine exceeds 2,500 springs per day. After forming, springs are bent back on themselves at either end and then heat treated. Heat treating for 30 minutes at 550 degrees Fahrenheit relieves the stresses of cold forming and increases yield strength, helping prevent any tendency of the springs to take a set in long service.

• **Use four kinds of Pittsburgh Steel wires**—Springs and other components are assembled in a jig for spot welding. In each assembly, four different types of a wire supplied by Pittsburgh Steel are used.

Basic wire, in gages 4 to 9, is used in part of the frames for seats and backs. Pittsburgh Steel's brace and border wire is employed for the borders, and upholstery wire in gages ranging from 6 to 16 is used to make the arch springs found at each end of seats and backs.

After assembly, seats and back units are covered with burlap as a base for upholstery and then shipped to customers.

Perhaps you have a new design which calls for something special in wire quality.

Pittsburgh Steel manufacturers wire, whether it's wire for cold heading, screws, wire rope or coiled springs, offers you the same benefits realized by Stubnitz Greene—low production costs, uniformity, specific tensile and yield strengths. Trained mill specialists can help with any wire problem. You can put these benefits to work for you immediately. Start by writing or telephoning the nearest district sales office listed here.

Spring elements are clipped to top border wire. Elements are formed from Pittsburgh Steel Co.'s zig-zag wire.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

(Concluded from Page 91)

added will not only increase steel supply for the Detroit market, but fill the requirements of the new Midwest Steel Corp. plant to be built as part of the expansion program in northwestern Indiana in the Chicago area. Midwest Steel will produce hot and cold rolled sheets, galvanized sheets, and tin mill products.

Mesta Machine Co., Pittsburgh, will construct a 45 in., continuous, annealing line at Weirton Steel Co., Weirton, W. Va. The new facility will have a capacity of 300,000 tons a year and will process coils up to 45 in. wide, weighing up to 1000 lb per inch of width.

Expands Gray Iron Foundry

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"If Wheeling is to stay in the fabricating business," he emphasizes, "we must have adequate facilities for operation, expansion, and product research."

FOR THE JOB—BUILT TO LAST!

Magor heavy duty air dump cars are designed to do just one job—speed up waste disposal. Low height and greater size means faster loading—fewer trips. Automatic dumping eliminates expensive labor and crane equipment. Smooth car interiors eliminate "dead load" returns.

Made for the job, Magor Air Dump cars can cut your disposal costs as much as 40%! And because they're made to last, your maintenance costs will be cut too! Tapered body ends and double plate construction across load carrying members, for example, adds strength and years of service.

Magor engineers are ready to show you how to cut today's high costs down to size.

MAGOR

Write today for details and for the new folder describing the heavy duty air dump car.

MAGOR CAR CORPORATION

50 Church Street
New York 7, N. Y.

NEW OFFICES

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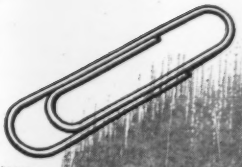
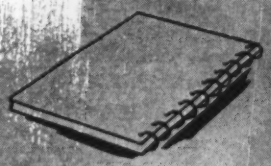
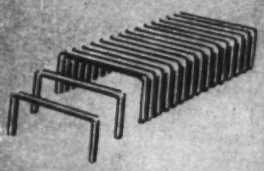


WIRE FOR PAPER CLIPS

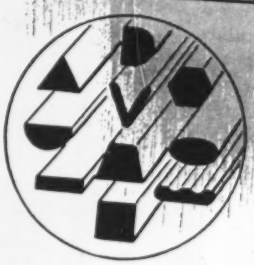


COIL BINDING WIRE



PREFORMED STAPLE WIRE

WIRE FOR MILK BOTTLE CARRIERS

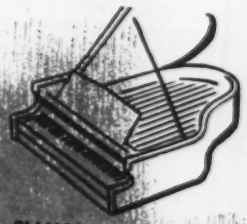


STANDARD AND SPECIAL WIRE SHAPES

Whatever your problem is in

Wire...

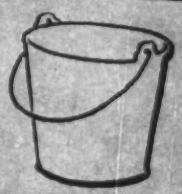
Thousands of wire applications in over a half century—involving virtually every kind of a wire problem—that's the experience and background we offer you in solving *your* special wire problems. We can supply wire from almost the size of a human hair, through 9/16" diameter for metal fasteners . . . round wire or wire in special shapes, practically any size, temper, finish and analysis in low carbon and medium low carbon steels. We may have a valuable case history that parallels your own special problem. Fill out and return the coupon for full details of Continental's Wire Service. We are eager to work with you.



PIANO COVERING WIRE

FLORIST WIRE

WIRE FOR TOY WHEELS



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STEEL CORPORATION · KOKOMO, INDIANA

PRODUCERS OF: Manufacturer's Wire in many sizes, shapes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special wire. ALSO Welded Wire Reinforcing Fabric, Nails, Continental Chain Link Fence, and other products.

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Gentlemen: Please give us without obligation complete details of your special wire service.

NAME _____ TITLE _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____

(*Concluded from Page 91*)

added will not only increase steel supply for the Detroit market, but fill the requirements of the new Midwest Steel Corp. plant to be built as part of the expansion program in northwestern Indiana in the Chicago area. Midwest Steel will produce hot and cold rolled sheets, galvanized sheets, and tin mill products.

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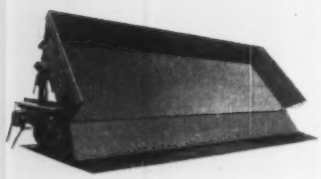
DESIGNED

FOR THE JOB—BUILT TO LAST!



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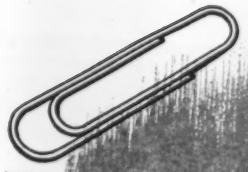

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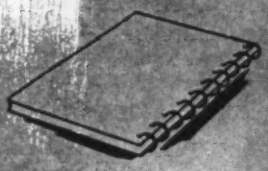

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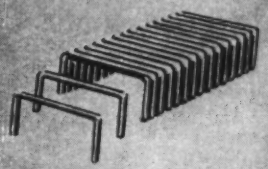

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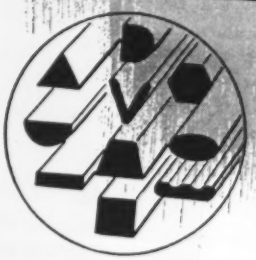

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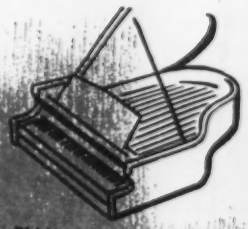

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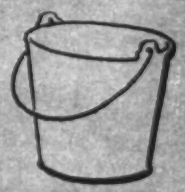

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NAME_____ TITLE_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

San Francisco, Calif. G. A. Watson is manager of the region; D. B. Reeder, western manager of metallurgical service.

CONSOLIDATIONS

Detroit Harvester Co., Oak Park, Mich., acquired **Weaver Mfg. Co.**, Springfield, Ill., producer of automotive service equipment. The property will be operated as a wholly owned subsidiary with Ira A. Weaver continuing as president.

Metals & Controls Corp., Attleboro, Mass., has been merged into **Texas Instruments Inc.**, Dallas.

Sale of **Continental Gin Co.**, Birmingham, maker of cotton gin and other machinery, to **Fulton Cotton Mills Inc.**, Atlanta, was scheduled to be consummated Apr. 21.

Master Power Corp. has acquired the operations of **Master Pneumatic Tool Co. Inc.**, Bedford, Ohio, and **Master Pneumatic Tools (Canada) Ltd.**, Toronto, Ont. Master Power is a recently organized subsidiary of Black & Decker Mfg. Co., Towson, Md., producer of electric tools. Master products include pneumatic drills, screw drivers, nut runners, impact wrenches, hammers, horizontal and vertical grinders, and a range of air hoists. Operations of the subsidiary will be under the direction of L. J. Roll, vice president and general manager. H. L. Williamson Jr. is general sales manager of the new Master organization.

NEW ADDRESSES

Alloy Tube Div., Union, N. J., Carpenter Steel Co., is moving its mideastern regional office on May 1 to Parkway Office Center, 875 Greentree Rd., Pittsburgh 20, Pa. Harry Hauser is the mideastern regional sales manager.

Nippon Kokan K.K. (Japan Steel & Tube Corp.) moved its branch office to 39 Broadway, New York.

Mills-Wolf Steel Co. opened new offices at 12434 Cedar Rd., Cleveland Heights, Ohio. The firm offers complete services for alloy steel plate, including fabrication, shearing, and flame cutting to size.

Amko Metals Co. (formerly A. M. Kunerth Co.), moved to larger quarters at 2306 Walden Ave., Cheektowaga, N. Y. The firm distributes flat rolled steel and aluminum products.

ASSOCIATIONS

Lake Carriers' Association, Cleveland, elected Robert G. Williams treasurer, succeeding F. J. Hollman who retired Jan. 1 after having been with the association for 39 years. Other officers are: President, Vice Adm. Lyndon Spencer; vice president and secretary, Oliver T. Burnham; and counsel, Gilbert R. Johnson.

Dr. George A. Roberts was re-elected president of the **Metal Powder Industries Federation**, New York. He is vice president-technology, Vanadium-Alloys Steel Co., Latrobe, Pa. The association also reappointed Kempton H. Roll as executive secretary and treasurer.

Powder Metallurgy Equipment Association, a trade division of the Metal Powder Industries Federation, New York, re-elected Byron B. Belden of Baldwin-Lima-Hamilton Corp., Philadelphia, president for 1959-60.

American Iron & Steel Institute, New York, appointed Karl F. Lukens as chairman of the Committee on Steel Pipe Research. Mr. Lukens is vice president in charge of sales of Wheatland Tube Co., Philadelphia, manufacturer of steel pipe and tubing.

A. F. Smith of the A. O. Smith Corp., Milwaukee, has been elected vice president of the **American Marketing Association**, Chicago.

James B. Carpenter, Baker Industrial Trucks, a division of Otis Elevator Co., New York, has been elected a vice president of the **Cleveland World Trade Association.**

Vinyl-Metal Laminators Institute has joined forces with the **Society of the Plastics Industry Inc.**, New York. Vinyl plastic film and sheeting is bonded to such metals as steel, magnesium, and aluminum.

National Association of Waste Material Dealers Inc., New York, elected George H. Einhauser, G. H. Einhauser Co., Pittsburgh, as president. Vice presidents are: A. U. Claghorn, Pioneer Paper Stock Co., Chicago; Theodore Gruen, International Minerals & Metals Corp., New York; Leo Selig, J. Solotken & Co. Inc., Indianapolis; and Harold Kurtin, Kurtin Wool Stock Co., Brooklyn, N. Y.

NEW PLANTS

Baker Steel & Tube Co., Los Angeles, opened a branch at 1255 22nd St., San Francisco, Calif. The 24,000 sq ft facility, plus offices, will carry steel, aluminum, and stainless steel tubing.

Adam Metal Supply Inc., Long Island City, N. Y., opened an aluminum warehouse at 520 York St., Elizabeth, N. J. It contains 25,000 sq ft of floor space and stocks over 3000 mill supply items. Marvin Marin is general manager of the branch while George Pollack is superintendent of warehouse operations.

Westinghouse Electric Corp., Pittsburgh, will construct a warehouse at Columbus, Ohio, to function as a major supply depot and inventory service center for its products. The building will contain 400,000 sq ft of floor space.

A $1,750,000 plant producing more than 35 tons of liquid oxygen, nitrogen, and argon a day has been placed on stream at Los Angeles by **National Cylinder Gas Div., Chemetron Corp.**, Chicago. E. G. Bolene is plant superintendent.

Ducommum Metals & Supply Co., Los Angeles, opened a Pacific Northwest Div. plant at 120 Dawson St., Seattle, Wash. The plant has 25,000 sq ft of warehousing and office facilities and stocks stainless steels, aluminum, brass, copper, and other specialty items. Joseph J. Ray is manager of the division.

Accurate Springs seal the goodness in

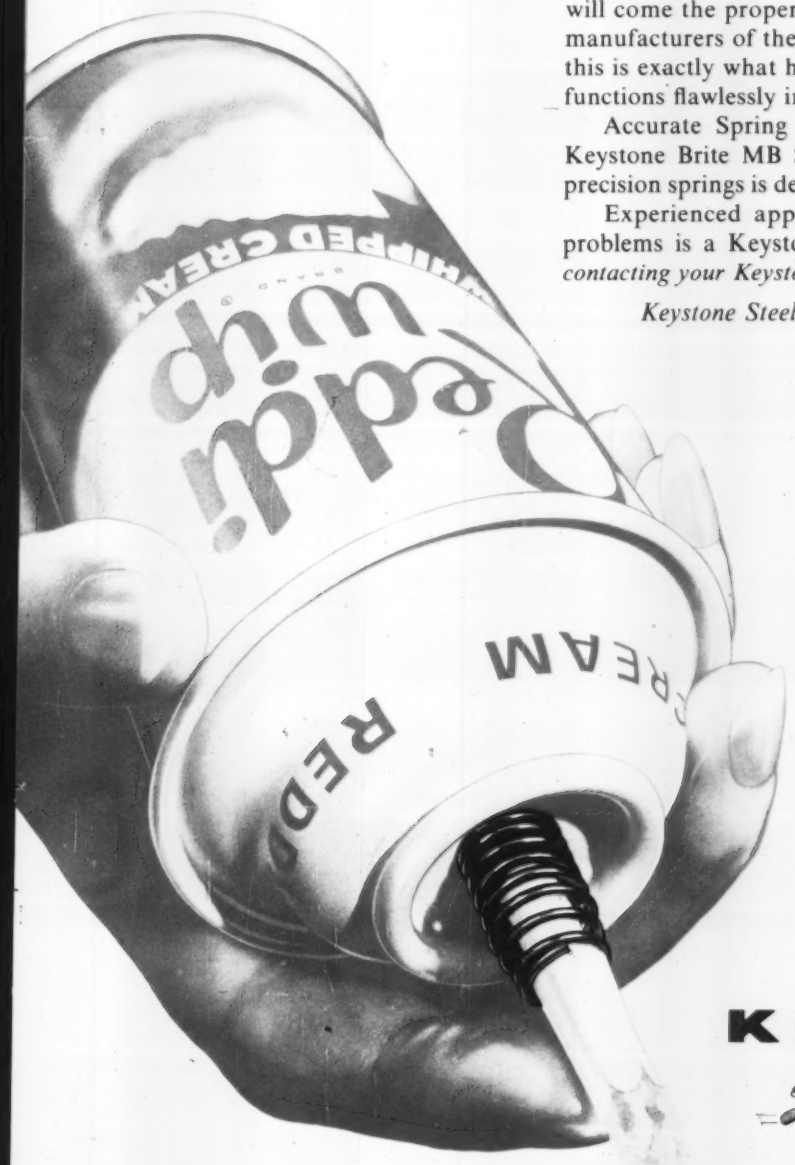
Accurate Spring Mfg. Co., Chicago, Ill. depends on Keystone Wire for millions and millions of springs that go into manufacture of "Reddi Wip" cans.

Mrs. Housewife takes it as a matter of course that when she presses the nozzle on a can of "Reddi Wip" whipped cream, out will come the proper amount of delicious whipped cream. The manufacturers of these modern dispensers have made sure that this is exactly what happens, by designing a small spring which functions flawlessly in this application.

Accurate Spring produces millions of these springs from Keystone Brite MB Spring Wire. This high production run of precision springs is dependent on absolute uniformity of the wire.

Experienced appraisal and prompt solution to your wire problems is a Keystone specialty. *This service can be yours by contacting your Keystone Representative today!*

Keystone Steel & Wire Company, Peoria 7, Illinois

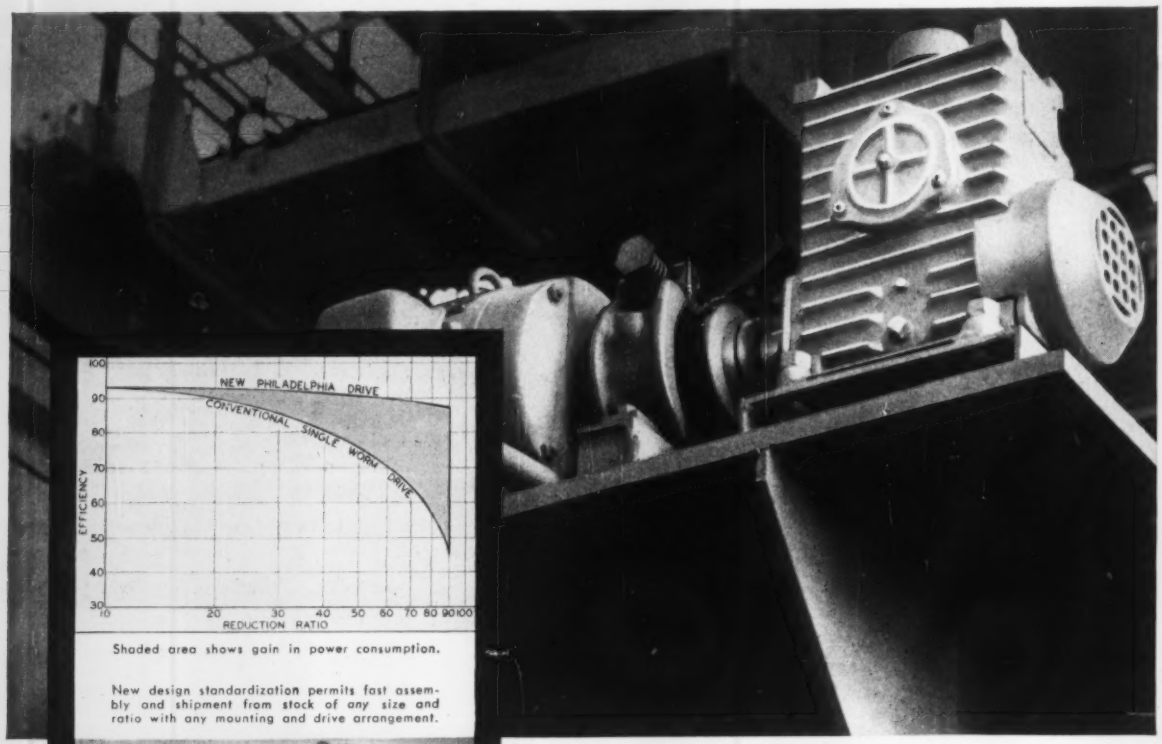


This spring must have exactly the right degree of stiffness, yet flex easily and have "sales-appeal" appearance. Keystone Wire meets these strict requirements for uniformity, correct resiliency and good plating quality.

KEYSTONE MB SPRING WIRE WIRE STUDY

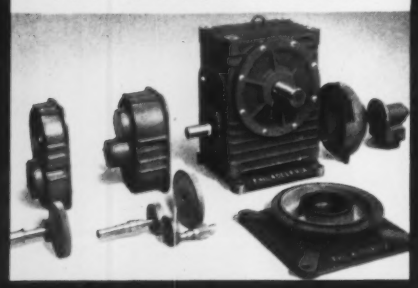
KEYSTONE

WIRE FOR INDUSTRY



Shaded area shows gain in power consumption.

New design standardization permits fast assembly and shipment from stock of any size and ratio with any mounting and drive arrangement.



NOW get new efficiency new savings in weight and space in worm gear drives

New high efficiency. These new drives offer efficiencies never before available in worm gear drives. Helical attachments for double and triple reduction units combine the efficiency advantage of helical gearing with the high ratio advantage of worm gearing. You save on power consumption . . . operating temperatures are lower . . . gearing lasts longer.

New high capacity. This is not just a re-rated line. Improved tooth forms, precision ground alloy steel worms, special high strength bronze gears, sturdy housings, precision ground helical gearing . . . all mean higher capacity in less space. In fact, you get space savings to 50% . . . weight savings to 60%. Or, you can handle loads up to 80% greater in the same space.

New flexibility. These new heavy duty high efficiency Philadelphia drives have a degree of flexibility never before available. One basic housing design can be combined with standardized horizontal and vertical mounting bases, worm gearing, single and double helical attachments, and fans, for any drive and mounting arrangement in the exact size and ratio to meet your requirements . . . standard or special. Torque control attachments for all sizes are available from stock for applications demanding overload protection. Ratios from 5⅛ : 1 to 1212 : 1. Center distances from 3″ to 21″. Write for catalog information.

PHILADELPHIA GEAR CORPORATION
Erie Avenue and G Street • Philadelphia 34, Penna.

philadelphia gear drives

Offices in all Principal Cities • Virginia Gear & Machine Corp., Lynchburg, Va.
INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

EXPLOSIVE CONEMAKING— A Canadian firm has found an explosive way to make cones directly from flat discs. Wall thickness of the product is the same as or slightly greater than that of the original disc. It eliminates welding a cone for a blank in explosive forming certain shapes.

PLASMA JET AIDS LABORATORIES— Spectrochemical analysis is much improved by passing a solution of the test specimen through a 15,000° F plasma jet. Elements emit spectra not obtained by ordinary analytical means, says the National Bureau of Standards, Washington.

NEW PH STAINLESS GROUP— Molybdenum is the helpful ingredient in a new 18-8 series of stainless alloys being produced by Cooper Alloy Corp., Hillside, N. J. The alloys are said to have greater resistance to pitting types of corrosion and have higher strengths up to 1400° F than corrosion-resistant precipitation alloys.

SPEEDIER WIRE DRAWING—Addition of a drawing deadblock to the end of a wire drawing machine is increasing the machine's output 15 to 25 per cent at the Kansas City, Mo., plant of the Sheffield Div., Armco Steel Corp. The deadblock attachment also produces larger bundles of wire —as much as 4000 lb on each stem, compared with 650 lb before the deadblock was added.

IMPROVED SAFETY DEVICE—A small tube about the size of your finger can detect and identify smoke, fire, or vapors. It operates on ultraviolet light, says Minneapolis-Honeywell Regulator Co., Minneapolis. It's expected to lead to great improvements in flame and explosive gas detectors.

NOTE FOR TOOL STEEL BUYERS—Two years from now no one will buy tool steel that is not vacuum melted, say steel industry sources. A. O. Smith Corp., Milawukee (it supplies huge rectifiers for vacuum melting furnaces), says the melting cost is down to about 6 cents a pound. Buyers are now able to justify a 25 per cent premium for vacuum melted tool steels. Reasons: Longer tool life, improved quality.

IMPROVED MANGANESE STEEL— Recent metallurgical developments of American Brake Shoe Co., New York, include an easily machined, nonmagnetic, manganese steel and a cast steel said to be stronger than any previously produced.

HARDENING NOTE—Auto people and makers of diesel engines are studying the possibility of hardening of crankshafts, journal and thrust bearings with explosives. Reason: Current methods fail to produce adequate hardness in billets.

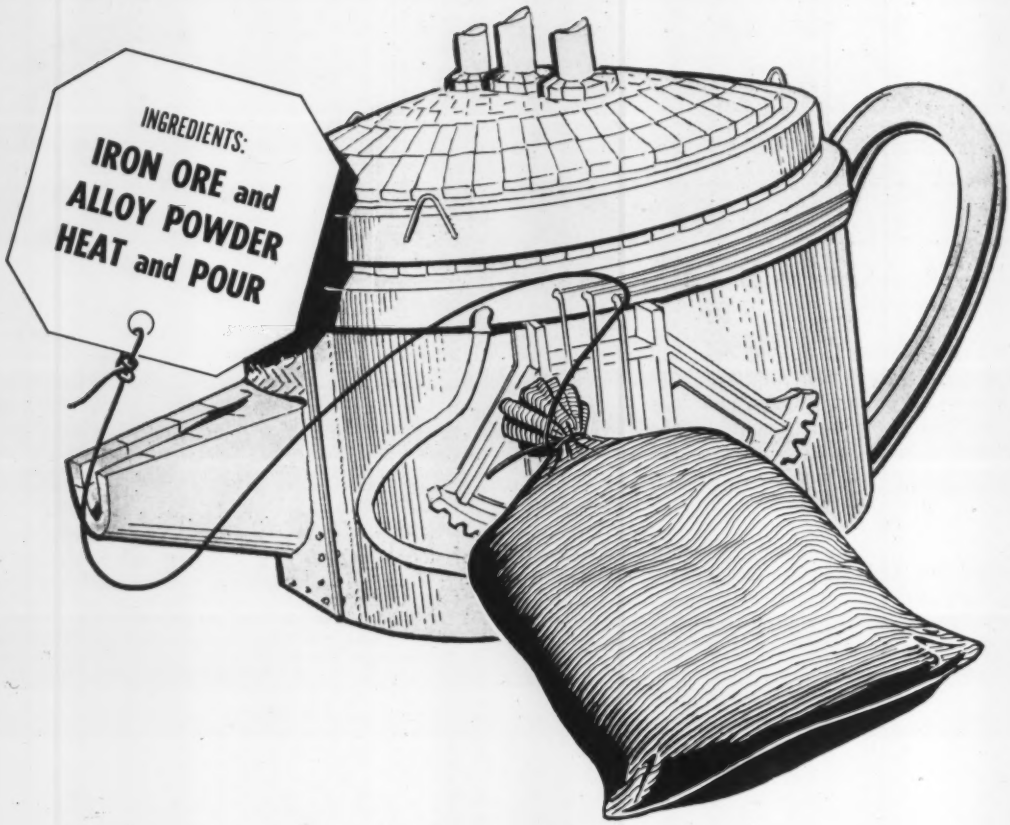
UPGRADING V-BELTS— A study by Ohio State University of factors that affect V-belt wear has enabled Dayton Rubber Co. to increase horsepower ratings of its Cog-belts two or three times. The ASME will have an opportunity to review the study at its June meeting in St. Louis.

WROUGHT IRON KEEPS UP—A modification of wrought iron will be used to shield a nuclear reactor aboard a Navy cruiser. A. M. Byers Co., Pittsburgh, calls it 4-D.

SUBSTITUTE FOR ANODIZING— A chemical oxidizing process is said to be cheaper than anodizing aluminum, says All-Brite Chemical Corp., Watertown, Conn. You can color it, or leave it bright. The finish also resists corrosion.

AN AID TO EXPLOSIVE FORMERS—You can record transient shock waves from an explosion by tying a strain gage to the piece being worked and connecting it to an oscilloscope. A Polaroid Land camera with open shutter records the details of the shock as it registers. The oscilloscope is set for a 4 microsecond sweep.

From Iron Ore to Steel



STEELMEN may have the answer to their dream of a one-shot steelmaking method in the Madrigal process.

The developer, International Ore Processing Co., Los Angeles, can mix an iron ore with an "alloying" compound and reduce the mix to a steel ingot in 35 minutes.

From 80 to 98 per cent of the available iron in an ore is recovered.

The process completely eliminates scrap and coke.

Costs: $30 to $35 a ton. (The saving in the average steel mill would be $20 to $25.)

The process should enable a small producer of steel castings to buy ore directly and refine it into steel. He is no longer dependent on pig, scrap, or coke. The company hopes to produce briquets of the ore-alloy and sell them to small founders.

• You simply charge the mixture into any kind of melting furnace.

To make steel, you start with the powdered ore mixture or prepared briquets. (You need 600 lb of alloying powder per ton of ore. It costs 1 cent a pound.) You can use any kind of heating—electric furnace, induction, or gas.

STEEL's editors watched two heats made in an induction furnace. The operator charged about 4½ lb of mix. (It contained an Arizona ore with about 60 per cent available iron.) Thirty-five minutes and three slagging-off operations later, steel was poured into a mold. The charge yielded about 3¼ lb of steel.

• The process facts bring mixed responses from steelmen.

A number of steelmen have examined that steel ingot. One even analyzed it and made a photomicrograph. In spite of some skepticism, most steelmen are impressed. The product is unquestionably steel, although copper and other element content is unusual. (It's the ore, say the Madrigal people.) Sulfur and phosphorous content in the steel parallels ore analysis. (See the accompanying table.)

• The product is a commercial base for production of high grade aircraft alloys.

Aero Alloys Inc., Anaheim, Calif., holds the franchise right to the Madrigal process. It makes high temperature, high performance metals for aircraft and missile work. The raw material is produced by the Madrigal process, and its proponents claim, many of the properties Aero gets aren't possible with con-

in 35 Minutes

Frank Madrigal, inventor of the process. Engineers, metallurgists, and steelmen will give his method the acid test.

ELEMENT	%
Carbon	0.18
Manganese	0.08
Silicon	0.05
Copper	0.25
Nickel	0.09
Chromium	0.02
Molybdenum	0.02
Sulfur	0.21
Phosphorus	0.07
Nitrogen	0.004

STEEL's editors saw ore reduced directly to steel and cast into an ingot. The results of the analysis are shown at the left. The unusually high quantities of alloying elements are due to the Arizona ore, say International Ore representatives. (It's magnetically separated from desert sand.)

Laboratory facilities of International Ore Processing Co. are housed in a Quonset building in North Hollywood, Calif. Equipment includes induction, electric arc, and gas furnaces

ventional raw materials like pig and scrap.

For example, it has developed a superior high-nickel-chrome alloy called American Air Alloys No. 249. Tensile strength: 12,000 to 14,000 psi at 2000° F. The sheet is fairly easy to handle with conventional metalworking equipment, says Glen Roland, president, Flotrusion Inc., Los Angeles. "We are impressed with the formability of this new alloy. We feel it is an exciting advance, and we are proposing it for a variety of aircraft and missile applications."

The alloy is also being made in 700 lb billets. Ductility is said to be exceptional in spite of high tensile strength.

• The process seems to have merit and is worth watching.

International Ore has been working on the direct reduction idea for more than five years. It tried all other known direct reduction methods and concluded that it had to have a one-shot method, not something that would end up with sponge. The present process took about two years to perfect.

It appears to be an unusual approach to direct reduction. What's needed now is for someone to check out the chemistry and metallurgy of the direct reduction and try some really large batches.

STEEL's conclusion: It could revolutionize steelmaking.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Inspector is checking component against blueprint specs prior to assembly

Focus on Inspection Costs Pays Off

Maker of sensitive gages used in rockets and jets found that its traditional methods were too cumbersome and time consuming. Optical instrument it chose is used as a measuring device in the production of parts and for quality control. Benefits are fourfold.

SEARCHING for another way to prune expenses?

Inspection costs may be a good starting place.

Taber Instrument Corp., North Tonawanda, N. Y., realized substantial savings through the installation of improved inspection facilities:

Inspection time was cut 75 per cent.

Chances for error were greatly reduced.

Maintenance costs were slashed.

Inspection costs were cut by one-third.

• **Product**—Taber manufactures a highly accurate pressure gage called the Teledyne electrical transmitter. It's a stainless steel instrument consisting of a base, cylinder, and top plate. The top plate contains a fluid pressure cavity which is protected against corrosive media.

Precision is a necessity since the instrument is used to indicate pressure changes encountered in such operations as the testing of a rocket, jet and turbine engine, and pulsations or surges which accompany the opening and closing of valves in reciprocating or rotary pumps. Strong and insensitive to shock and vibration, the instrument allows the relay of these changes (often over hundreds of feet) to be read accurately on telemetering instruments.

• **Saw Need**—Joseph F. Less, Taber's plant manager, felt that its traditional inspection methods (gage blocks and air gages) were inadequate.

The solution: Install optical gaging equipment to: 1. Speed up operations. 2. Improve quality control. 3. Reduce manpower required for this operation.

Taber chose the DR-25 optical gage made by Bausch & Lomb Optical Co., Rochester, N. Y. It is used as a measuring device in the production of the parts and as a quality control unit.

• **The Setup**—In the first step, the optical gage is used to check the various cuts on components immediately after they have been machined on the lathe. After that, each component is checked, and, finally, the assembly is inspected prior to testing.

By placing inspection units at each stage, the company says machine operators and inspectors can be certain that parts are consistently checked for accuracy as they move from production to final assembly.

Assembled parts are inspected before they are sent to testing department

For example, in turning the base of Model 176, a check must be made to assure that the sensing ring will fit accurately into the base. The tolerance of the machined surfaces of the ring and base assemblies is held to within 0.0002 in. to 0.0005 in. The design of the optical gage allows the lathe operator to make immediate readings directly from an illuminated magnified scale.

• **Method Is Precise**—Since the optical gage permits measurements to be made to reading intervals of 0.0001 in., with an accuracy of 0.000025 in., the operator can be certain of meeting specifications on the depth and parallel measurement of the slot. In grinding and inspection of the base and ring assembly of Model 206, the optical gage measures a dimension deep in the cavity of the instrument to an external surface within plus or minus 0.0001 in.

To inspect the measurements of the Teledyne cylinder, the part is placed on a 0.5 in. standard ring which rests on the anvil of the optical gage. The anvil has a flatness accurate to 0.000005 in. The height and various steps of the cylinder are checked for accuracy and parallelism. The optical gage assures that tolerances will be kept within the specified plus or minus 0.0001 in.

The top plate or cap of the Teledyne is placed on a 0.5 in. standard ring in the same manner as the cylinder.

The spindle of the optical gage is lowered and the inspector can check depth measurements on various steps of the part.

Because of the need for extreme accuracy, components must be ground to plus or minus 0.0001 in. The inspection department has found that the optical gage assures that the instrument ring of each Teledyne is completely protected from overload. A direct reading feature of the gage has made it possible for each instrument to be quickly inspected for accurate reading, the company says.

• **Benefits**—Mr. Less says almost all operations are done in one-quarter the time previously required. "We find that we no longer require gage blocks and special inspection gages to meet the various specifications in the production of our transmitters."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Flexible Line Automates Hot Dip Galvanizing

Machinery uses electrical controls and program timers to process small or large parts. All items pass through the same pickling line and galvanizing kettle. Small parts, in baskets, are spun in a centrifuge; larger ones, mounted on racks, pass through a quench tank

HOT DIP galvanizing is done automatically with rack and centrifuge equipment developed by Malleable Iron Fittings Co., Branford, Conn.

The machines use electrical controls and program timers to regulate immersion time, washing cycle, withdrawal time, and quenching time. Less skilled labor is needed; all cycles can be preset or prescribed by the foreman.

Automated galvanizing equipment is practical only if the same item can be processed for long periods, or if machinery is flexible enough to run a variety of parts without major adjustments, says H. S. Hansen, manager, galvanizing and special equipment sales.

• The machines can be tailored to each galvanizer's application.

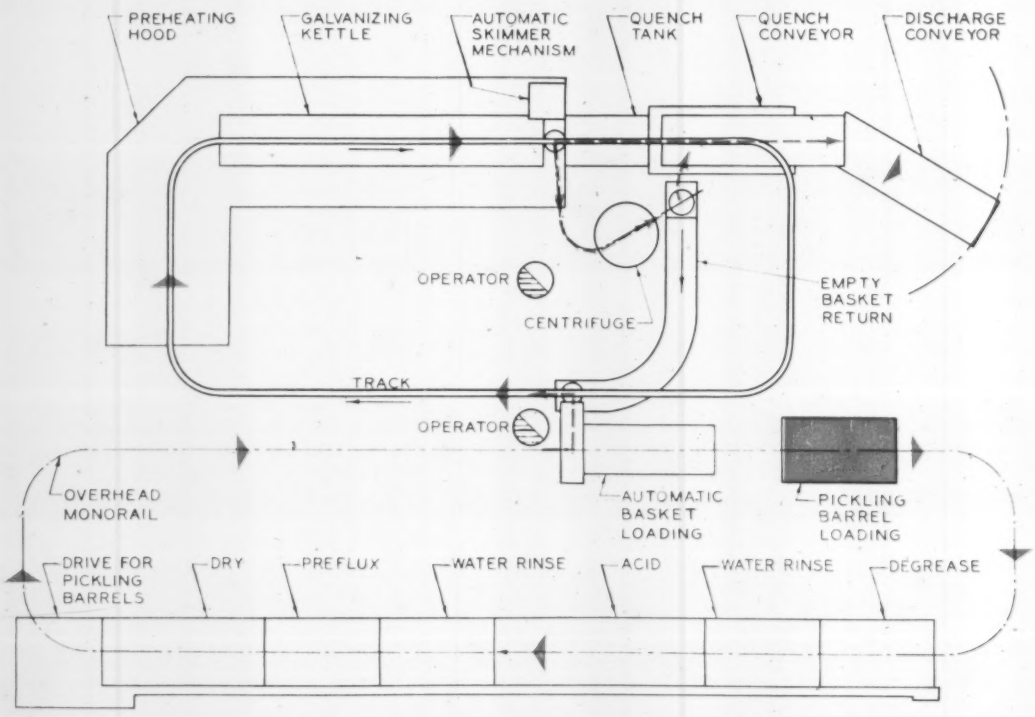
Multiple tracks permit handling of several basket sizes. It's possible to change from one size basket to another, or to racks, while the machine is in operation.

Machines can be made portable. One is mounted on wheels, so it can be rolled away from the kettle. Others can be suspended from overhead tracks or picked up by bridge cranes. That makes the kettle accessible for drossing or other purposes.

The equipment can be made part of a plant-wide system, because it's built around a standard trolley conveyor. Output: 3000 to 5000 lb of parts (weighing 1 lb or less) per manhour. The number of baskets immersed at once can be varied to meet production needs.

• An automatic pickling system removes all grease, scale, and oxides from parts before they're galvanized.

Parts are taken through an acid bath, water rinse, and prefluxing tank, then through the drying stations in 10 cu ft Monel barrels, ro-



The same system is used for rack or centrifugal galvanizing, but rack mounted parts pass through a quench tank instead of the centrifuge

tated in the tanks for efficient pickling. They're dried by internal heat received from hot zinc ammonium chloride solution in the prefluxing tank.

• **Initial operations are the same for rack or centrifugal galvanizing.** After pickling, parts are dumped into an open hopper or loading chute, and transferred to baskets riding on a gravity roller conveyor. They're picked up by an overhead conveyor, and lowered into the galvanizing kettle as quickly as possible without floating.

After cooking, parts are washed up and down through the flux blanket, then submerged while an automatic skimmer clears flux and oxide from the surface at the exit end of the kettle. Baskets are withdrawn and disconnected from the conveyor, and spun in a centrifuge to remove excess zinc. Parts are then dumped into the quench conveyor.

Rack mounted items are passed through a quench tank at the exit end of the kettle, then dumped into the discharge conveyor.

Survey Shows How to Up Carbide Tool Life

Here are some tips on production and tool life based on a survey by M. A. Ford Mfg. Co. Inc., Davenport, Iowa. They involve the use of Ford's Hi-Roc solid carbide drill in industrial applications (from aircraft to atomic plants).

The company says 90 sfpm is the correct speed for hardened steel.

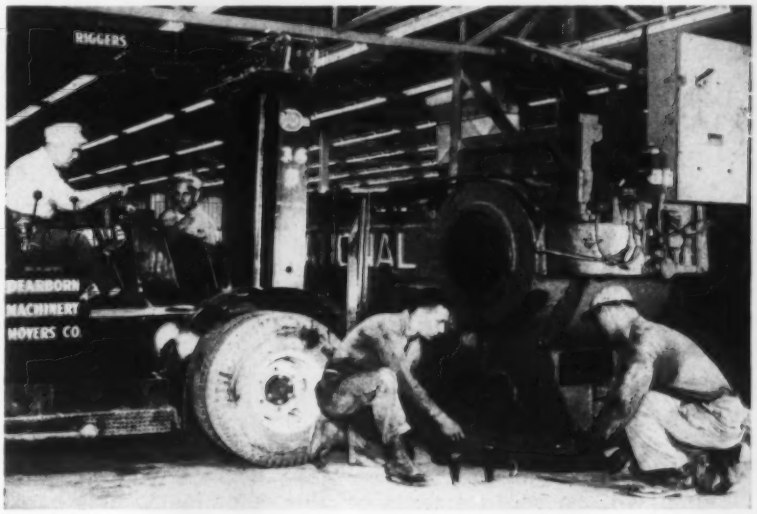
A 150 sfpm speed is recommended for annealed alloys; it improves chip flow. A constant feed of ½ to 2 in. per minute is advised to avoid excessive wear.

A water soluble flood is recommended for both applications. As a second choice, a mist coolant can be used. Tight gripping chucks are required. Bushings should be used where overhang is unavoidable.

The solid carbide drill cuts chips in hardened steel up to 65 Rockwell C. It is also used for drilling annealed, high tensile alloy steels, for drilling sample chips in metallurgical analyses, for drilling Stellite material, and for tap drill and modified reamer applications.

Machine Mounting Pads Cut Installation Time 20%

They're slipped into place easily, securing equipment satisfactorily without lag screws or bolts. Thickness may be ¼ to 1 in., depending on loads, vibration, and desired degree of noise suppression



CONSIDER MOUNTING PADS if you're going to move or rearrange production machinery. They saved 20 per cent in installation time at Pittsburgh Screw & Bolt Co., Pittsburgh.

Additional benefits: Lower noise and vibration levels, reduced worker fatigue, and the elimination of floor damage caused by mechanical fastening methods.

• **Case History**—Pittsburgh Screw was moving into a new plant. About 1000 pieces of equipment (ranging from 500 lb to 51 tons) were involved. Included were bolt headers, boltmakers, bolt trimmers and rollers, and secondary finishing equipment.

An important consideration: Some machines couldn't be tied down with ordinary bolt mountings because of high vibration (up to 250 strokes per minute).

To lick the problem, Pittsburgh Screw tried Unisorb fiber mounting pads made by Felters Co., Boston. The reason: A seven-year-old test installation showed that the mounting absorbed vibration (up to 85 per cent), lowered noise levels, and secured machines satisfactorily. It also was found to be faster than methods using lag screws or bolts. (Cement is used.)

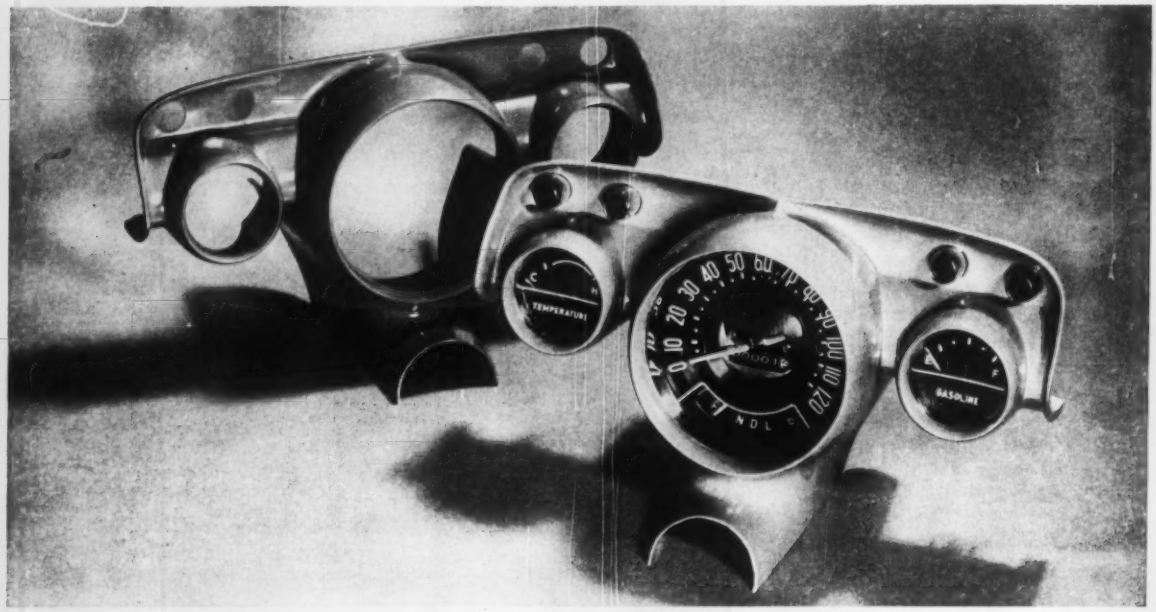
• **How**—The machine is put in place, raised on one end, and a Unisorb pad (cemented on both sides) is placed under it. If shims are required, they are cemented between the floor and the pad.

Oil or other usual factory cutting compounds will not affect adhesion of the plastic base cement. If moving is necessary, a special solvent will loosen the bond.

Felters also makes ajustable mounting pads. Load ratings are 7500 lb per unit. Machine legs are mounted on a special leveling screw and plate assembly, which rests on a base plate.

Plasticsmaker Challenges Diecasters

One of many examples: This instrument cluster housing



Tests of a new plastic indicate that 75 per cent of its market volume will be replacements of zinc, aluminum, and brass diecastings, says Du Pont

ABOUT JUNE, you should be able to buy a new kind of plastic which will compete with aluminum, zinc, and brass diecasting metals.

The maker, Du Pont, calls this product Delrin.

Its tensile strength: 10,000 psi at room temperature.

Other plus features, says Du Pont, are good dimensional stability, resistance to chemicals and solvents, excellent resistance to fatigue and creep. It is also rigid and slippery, a property which makes it fine for bearings.

Price: About 95 cents a pound. (When volume production arrives, Du Pont sees the price falling to around 80 cents.)

• It is proposed for a wide variety of uses.

Delrin has been tested in automobile parts (instrument clusters, fuel pumps, carburetors), gears, bearings, and bushings. The material appears to work well in hardware, business machines, plumbing items, and Aerosol bottles.

During the last three years, the firm supplied limited quantities free to more than 250 firms. Test products varied from harpsichord plectra (to replace crow quills) to sparkplug gaskets (they melted). But Aerosol bottles held up under 13 times normal pressures and a speedometer gearshaft of Delrin ran against a steel worm for 100,000 miles at 110 mph with little wear.

• Despite higher cost of raw material, it is supposed to compete successfully with metals.

Delrin resin costs seven times as much as zinc. Even correcting for volume, it costs twice as much. But it catches up with its metal competition in machining and finishing costs.

Du Pont builds its case this way. Take some part which would weigh 2 ounces in plastic. Made of aluminum, it would weigh 3.7 ounces; in zinc, 9.3 ounces.

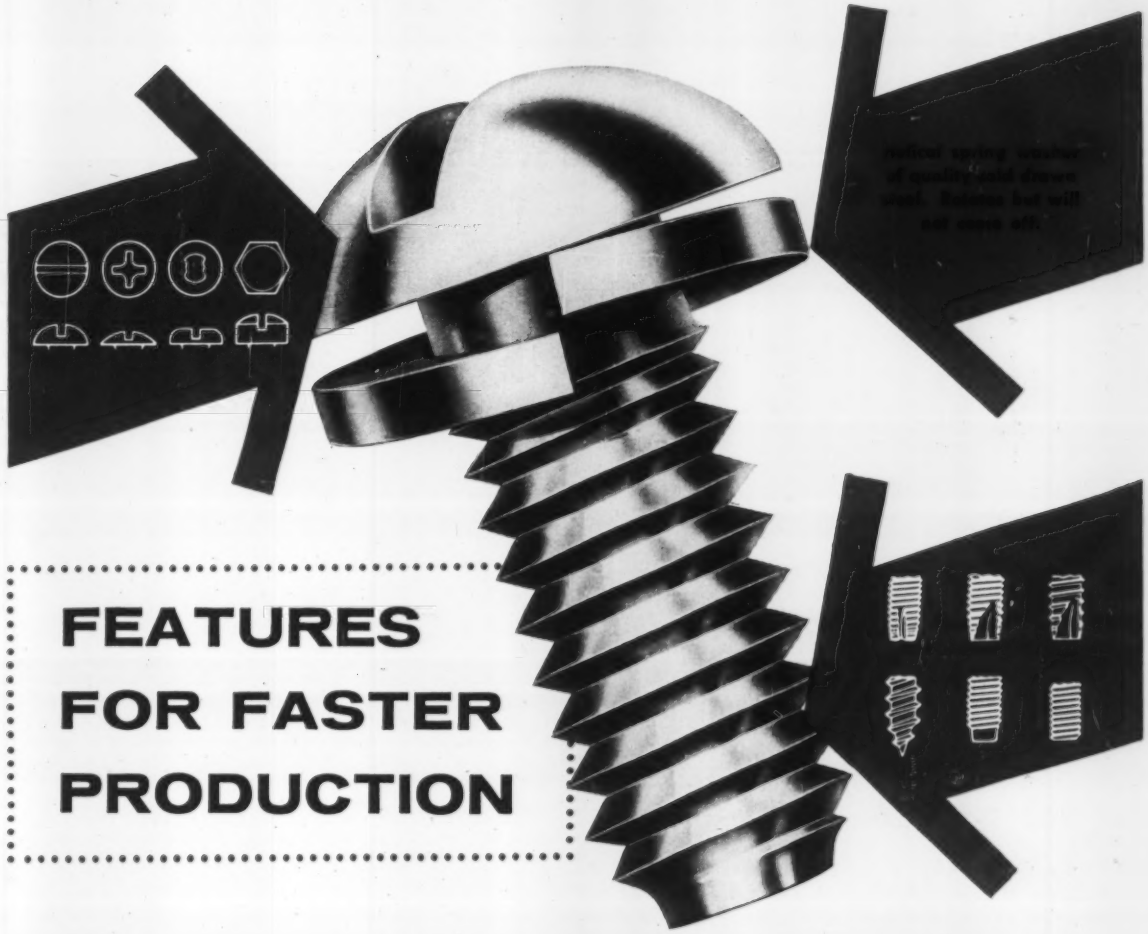
With a moderate amount of machine finishing (flash removal, drill, ream, and tap), the metal part would cost 23 or 24 cents. The same piece in plastic should run about 22 cents, provided, of course, that Du Pont makes good its claim of 80 cent raw material.

• Plastics competition will count on savings in finishing and shipping, too.

A plastic refrigerator handle in colored Delrin costs a fourth less than a metal handle that must be buffed and plated. The auto instrument cluster illustrated weighs 80 per cent less than metal when made of Delrin. Good electrical insulating properties are said to be a bonus feature.

Du Pont says Delrin represents 300 manyears of laboratory research, three years of testing, and financial investment that exceeds what it put into nylon development.

THE BEST INDUSTRIAL FASTENER FOR THE MONEY



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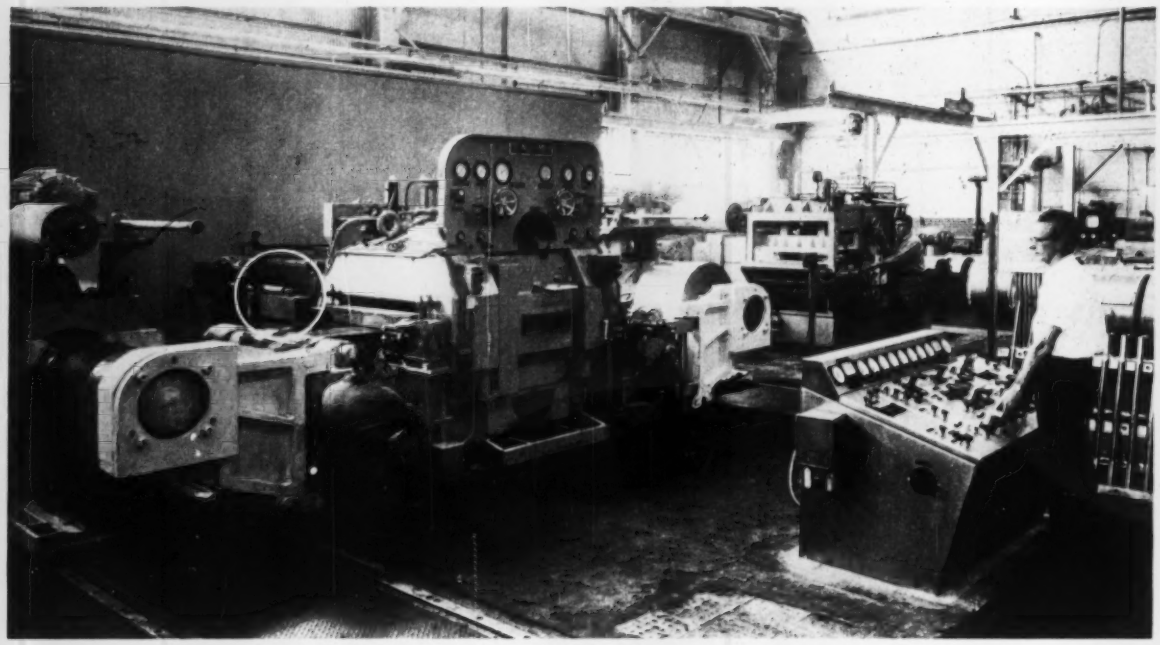
Radiation Gages Control Sendzimir Mill

How noncontact unit is mounted is shown in circle



Rays measure the thickness of stainless steel strip continuously; a servosystem changes screwdown setting at a rate proportional to strip thickness variations

MODERNIZATION and expansion of facilities are expected to increase stainless steel production as much as 25 per cent at American Steel & Wire Div., Cleveland, a division of United States Steel Corp.

Important feature: A 37 in. Sendzimir mill that uses beta-gamma ray gages and controls. The mill was supplied by Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. The automatic thickness control system was furnished by Industrial Nucleonics Corp., Columbus, Ohio.

• Noncontact gages measure strip thickness continuously and actuate screwdown controls.

Position of the mill screwdowns is changed continuously by signals from a radiation type gage, at a rate proportional to strip thickness error.

Two of the gages are used on the mill, to control passes in either direction. They hold mill output within 1 per cent of specified thickness.

The mill accepts strip up to 0.175 in. thick, reducing it to a minimum gage of 0.005 in. After a reduction of more than 50 per cent, the metal must be annealed to relieve work hardening stresses before further rolling.

• Beta and gamma rays, used to measure different thicknesses, are derived from the same source.

Strip thickness is measured as a function of penetration by rays from a radioactive source. Beta rays are used for steel 0.005 to 0.028 in. thick.

Production of gamma rays, used for heavier gages, is similar to x-ray generation in a vacuum tube, but a high voltage power supply isn't needed. Beta rays, fired at a target, produce gamma rays for measurement of steel 0.028 to 0.175 in. thick.

• Accuracy is assured by frequent gage standardization.

After each coil is rolled, the gage is withdrawn from operating position for a 40 second standardization period. It's automatically compensated for environmental changes. Examples: Ambient temperature changes and accumulation of dust or oil on the aluminum window of the radiation source.

Correction is also made automatically for decay of radioactive material in the radiation source, or drift in electronic circuits.

COOPERATION

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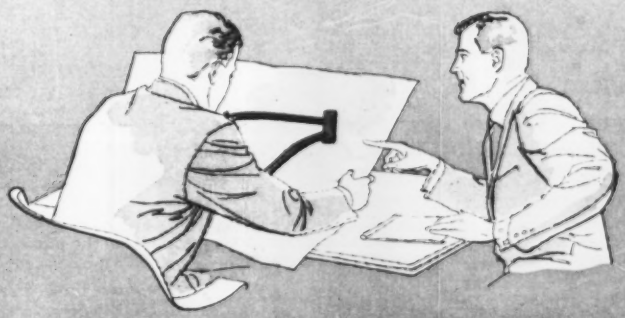
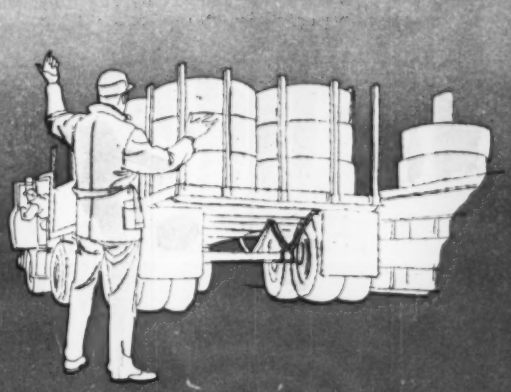


at Alan Wood



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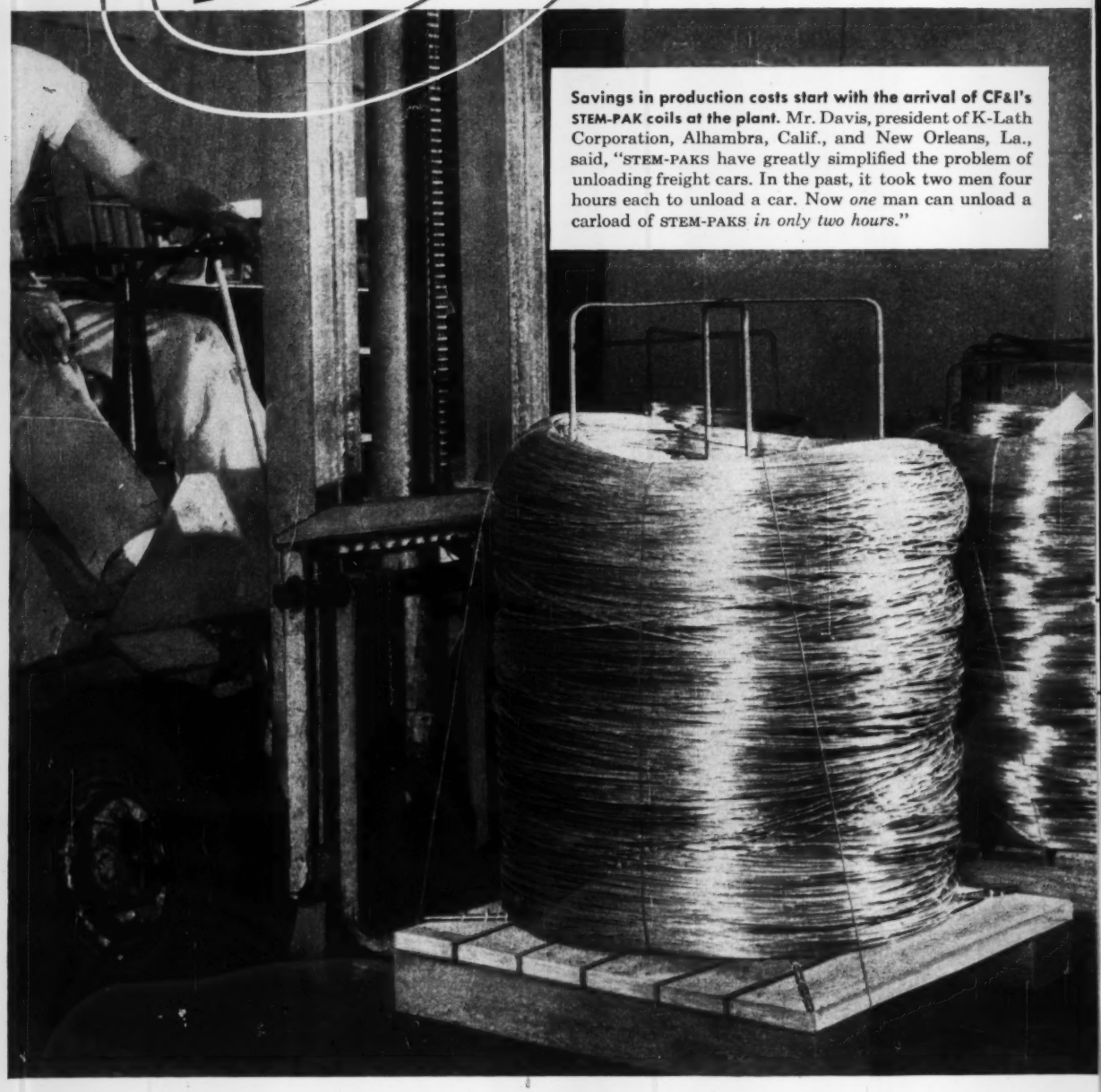

Savings in production costs start with the arrival of CF&I's STEM-PAK coils at the plant. Mr. Davis, president of K-Lath Corporation, Alhambra, Calif., and New Orleans, La., said, "STEM-PAKS have greatly simplified the problem of unloading freight cars. In the past, it took two men four hours each to unload a car. Now *one* man can unload a carload of STEM-PAKS *in only two hours.*"

helps K-LATH increase production 50%

Continuous production achieved by butt-welding the start of a new STEM-PAK to the end of a nearly expended PAK. This change-over takes less than 5 minutes. No machines are stopped. "STEM-PAK'S coils, which hold up to a half-ton of wire, permit us to run each machine as much as 1½ hours longer per day than when we used conventional coils," pointed out Mr. Davis.

K-Lath, an unusual type of lath made of kraft paper reinforced with CF&I Steel Wire, is finding wide acceptance among plastering contractors. "CF&I's clean, galvanized wire helps us to produce a brighter, better-looking product that appeals to contractors," explained Mr. Davis. "CF&I's excellent quality control also assists us in maintaining our own high standards of quality."

problem: "Our production machines are designed for the interlacing of kraft paper with galvanized wire," said Mr. Davis. "As we use about 370 miles of wire daily, our biggest problem was the time lost when we replaced the wire coils feeding our machines. The entire production line came to a halt each time we changed one of the coils."

solution: "Our request for technical assistance from CF&I was answered by a team of engineers," continued Mr. Davis. "These men developed the special STEM-PAKS which have aided us in achieving a continuous operation. Up to 75% of our production downtime — before we began using CF&I products—was caused by using too many small coils. STEM-PAKS hold 800- to 1,000-pounds of continuous, quality galvanized steel wire. These larger packages keep each machine running as much as 1½ hours longer per day. There is a minimum of tangled wire because STEM-PAKS allow free unwinding, without snarling. We have used CF&I STEM-PAKS to increase our production 50%."

Before you order wire, consider your own production problems. Then choose a CF&I wire package that can give you one or more of the following benefits:

- reduced downtime through extra-long lengths of wire
- simplified inventory control
- fast, economical unloading and in-plant handling
- assured cleanliness of the wire

Why not contact our nearest sales office today? Our technicians will be glad to visit you and discuss your packaging requirements.

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6284

Grumman engineers wanted a lighter, stronger arresting hook for carrier-based fighter planes. Improved version (right) made of a vanadium-modified steel forging, is an example of how . . .

Martempering Solved Strength Problem

PROBLEM: Find a hook material that can take the 90,000 lb shock of stopping a Navy fighter traveling more than 180 mph in half a second when it lands on a carrier.

SOLUTION: A modified steel forging (4330 vanadium) martempered and heat treated to 240,000 psi tensile.

Grumman Aircraft Engineering Corp., Bethpage, N. Y., says the hook is the "best in the business." Added benefits: Lugs on the hook points no longer separate or open up during landings, and a new contour (made possible by the stronger metal) eliminates a tendency to pick up two arresting cables instead of one.

• Engineers tried many materials and processes but almost overlooked martempering.

The hooks previously used were welded forgings. A change to a casting helped to lighten the part. Shortly afterward, Charles Weiznecker, a Grumman engineer, decided to try a 4330 cast steel hard faced with Colmonoy. Tensile strength was 95,000 psi—barely enough to get by specifications.

Mr. Weiznecker says: "I decided to try an approach we all had overlooked as too simple—martempering. It seemed impossible to heat treat and quench the hooks because of the different expansion rates of the hard facing and the basis metal."

Martempering solved the problem since quenching is carried out in a 525° F salt bath rather than oil at room temperature. The 4330 castings developed what was then considered a phenomenal 180,000 psi tensile. The switch to a forging increased that to today's 240,000 psi.

• The search is continuing for a similar solution for a nonmagnetic hook.

Grumman's new S2F-3 is an antisubmarine airplane which carries a lot of electronic gear. The hook must be nonmagnetic to minimize interference with magnetic detection equipment.

Grumman is considering A-286 with a Metco hardfacing material. Hooks are quenched in conventional oil. Problems yet to be solved include lowering costs, finding better production methods, and additional hardfacing for the hook point.

Westinghouse Steps Up Machine Buying

Management attacks obsolescence with a program that challenges every machine in use. As much as 20 per cent of the equipment in some departments may fail to pass the test

MANAGEMENT at Westinghouse Electric Corp., Pittsburgh, figures it must step up its buying of new, more efficient machine tools.

At the company's Machine Tool Electrification Forum at Buffalo, G. W. Jernstedt, manager of manufacturing planning, said: "We want our divisions to buy more new machine tools and other manufacturing facilities than they have in the past." Why?

Mr. Jernstedt says: "41 per cent of our machine tools are over ten years old, and 16 per cent are over 20.

"If both the machine tool builders and the electrical industry were on their toes, we would not have to manufacture our products with this amount of old equipment."

• A two-pronged program within the company is aimed at modernization. The key words are "replace" and "retire."

Whenever new facilities will show an over-all saving of at least 20 per cent on the added investment, the replacement is considered justifiable. The principal difficulty with the policy is that, too often, a replacement is considered only as the substitution of a new machine for an old, but similar one.

"The best way to get maximum savings is to examine the over-all method to see if new equipment can perform not only the required operation but also additional operations, and material handling as well," says Mr. Jernstedt.

As for retirement, facilities are to be disposed of when they are not required to produce standard volume (or anticipated volume in the next three years) on a two-shift operation.

• Six questions put the old machines on the defensive.

They are: Can this operation be done on other machines so we can release this machine? Can we make a design change to eliminate this operation? Should this machine, or combination of machines, be replaced with improved or special machines? Can we improve the operation by a change in layout or retooling? What number of hours will this machine be worked per day to meet volume requirements? Can we declare this machine surplus?

Mr. Jernstedt figures that those questions can lead to removal of up to 20 per cent of machines in a department.

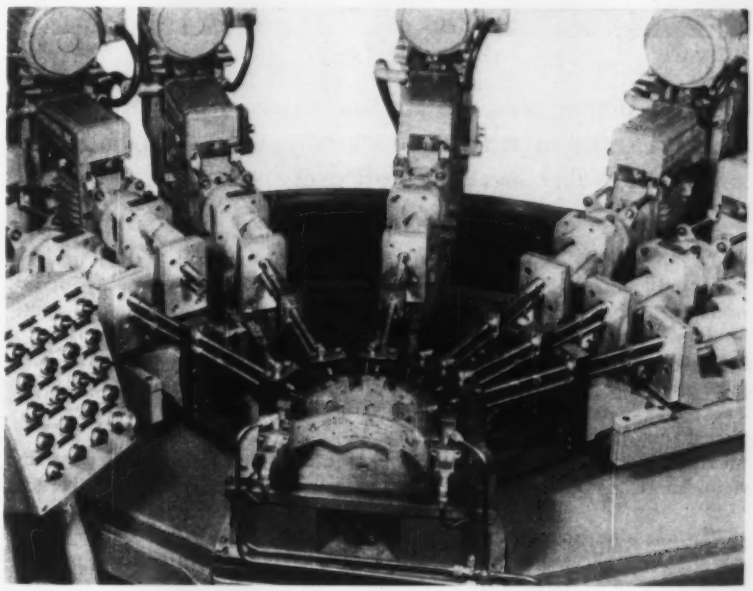
• Part of the challenge falls on the shoulders of machine tool builders, says Mr. Jernstedt.

"The machine tool builder must critically question the function that his product serves for his customer," he explains.

What's needed? For one thing, new approaches to old problems. Mr. Jernstedt cites: "Machines such as the programed, six-spindle Burgmaster drill; the new, tape controlled Kearney & Trecker Milwaukee-Matic, and the Ingersoll double table, planer-miller represent improvement in methods."

Other products he would like to see considered: A boring-milling machine like the planer-miller; machines for cutting with electrons; combination machines that would double up on welding, or grinding, or shearing.

Also, Mr. Jernstedt asks builders to take a hard look at the savings potential in inventories, production control, material handling, maintenance, supervision, and floor space.



THESE DRILL UNITS handle 3600 brake bands an hour for a supplier of brake assemblies. Setup time was reduced 86 per cent. Up to 121 different hole patterns can be obtained by moving the individual units left or right, or forward and back. A one nut adjustment presets the angle gage on each unit. The units can be combined to drill or counterbore. Required depths are maintained to ±0.0005 in., says Drillunit Inc., Detroit

Die Shear Line Is Flexible, Accurate

Electronic control allows sheet length to be changed instantly

Machine outperforms larger, more expensive equipment, and costs little to maintain. It's only 18 ft long, including coil holder, roller leveler, cutoff press

LOOKING for a flexible, accurate, high production machine to cut or form sheet metal? A die shear line, developed by McKay Machine Co., Youngstown, may be just what you need.

It takes a fraction of the space needed for more expensive cutoff machines. It often outperforms them, company officials claim.

• The machine uncoils, levels, and cuts or forms sheet metal in a continuous operation.

An expanding mandrel payoff reel feeds 5 ton coils (48 in. wide, up to 10 gage) into a roller leveler that produces commercially flat strip. Secondary leveling isn't necessary.

A synchronized traveling die-holder accelerates to strip speed, cuts, and returns to its starting position. If notching or piercing is to be done near the shear cut, necessary tools can be installed with the standard cutoff blades.

• Electronic control offers accuracy, flexibility, and volume production.

A pulse generator, geared to the exit pinch rolls of the leveler, drives an electronic counter to trigger the die acceleration system. Length of the cut is preset with pushbuttons on the counter. Optional: Automatic programing, using data processing cards, punched paper tape, or a series of manual controls for selecting lengths and quantities.

Electronic measurement, with direct readout in inches, keeps sheet lengths within close tolerances.

Sheets 4 ft or more long can be cut at 200 fpm.

Shorter lengths call for lower strip speed.

Volume output is possible with sheets of different sizes because sheet length is changed instantly, without slowing or stopping the machine.

• The machine's size, modest capital investment, and simplified maintenance are attractive to users.

The line is only 18 ft long vs. 60 for comparable cutoff equipment. Capital outlay: As little as $80,000. Uncomplicated alternating current drives and controls and reliable electronic components assure low maintenance cost.

The machine should find wide application in metal fabricating plants and warehouses, says McKay.

ROLLWAY MAXIMUM BEARINGS

. . . . . What's the limit: Heat? Shock? Speed? Or complicated radial and thrust loads?

Name the combination of requirements . . . and chances are you'll find them met by a Rollway Maximum precision radial cylindrical roller bearing. If not, then Rollway engineers will modify any factor to meet your application.

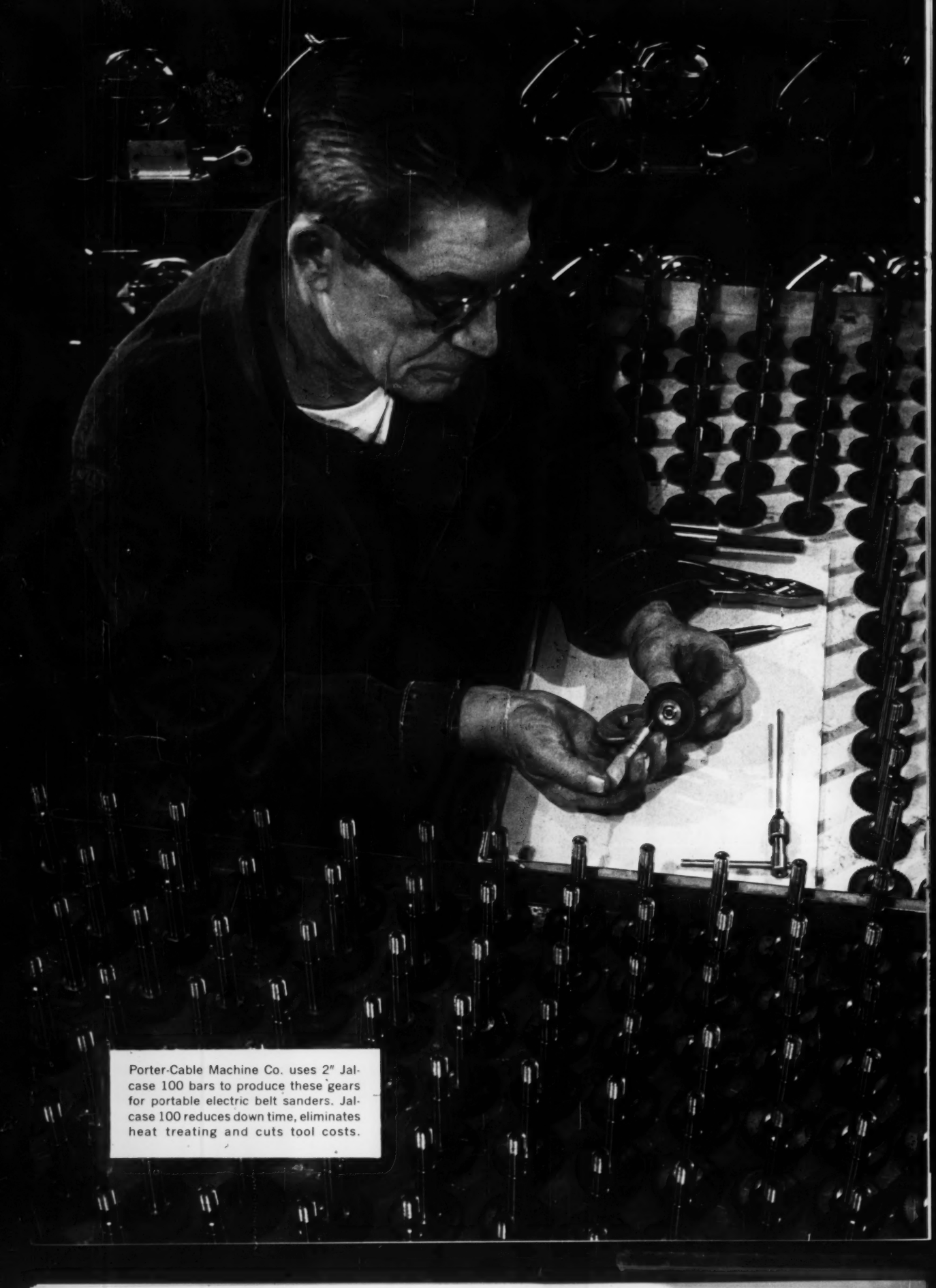
Rollers are crowned to prevent end-loading and the resultant spalling of races. Directional trueness is maintained by retainers of standard bronze or "Rollube" ferrous alloy of one piece or two piece construction.

You may wish to refer to the Rollway Catalog and Engineering Data Book when writing specifications for a high precision bearing. It contains the first listing, by any manufacturer, of the thrust capacities of cylindrical radial roller bearings. Send for it today.

ENGINEERING OFFICES:

Syracuse Boston Chicago Detroit
Toronto Pittsburgh Cleveland
Seattle Houston Philadelphia
Los Angeles San Francisco

ROLLWAY®
BEARINGS
COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS



Porter-Cable Machine Co. uses 2" Jalcase 100 bars to produce these gears for portable electric belt sanders. Jalcase 100 reduces down time, eliminates heat treating and cuts tool costs.

"Jalcase 100 increased tool life 50%, eliminated need for heat treating"

. . . reports Porter-Cable Machine Co.

"J&L's Jalcase 100 meets our requirements for a steel that satisfies these four specifications:

1. Enough hardness for use in gears and jack shafts without need for heat treating;
2. High machinability for profitable operation without down time;
3. Uniform metallurgical structure;
4. Minimum distortion from residual stresses.

"Our shop experience with Jalcase 100, on six-position automatic machines with up to 21 high speed tools, shows tool life is increased at least 50%, hob life increased 30%," states Porter-Cable Machine Company official, Syracuse, N.Y.

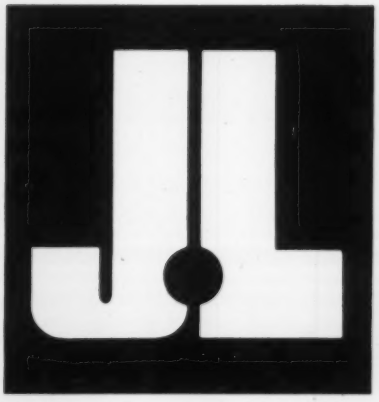
Jalcase 100 is a new grade of Jalcase cold finished steel bars, specially processed for easy machinability with minimum distortion. It features guaranteed minimum yield strengths up to 105,000 p.s.i., guaranteed minimum hardness up to 248 Brinnell, and stabilized residual stresses. A new leaded product known as Jalcase 100-L is believed to be the most machinable high strength steel yet developed.

Call in a J&L steel specialist for a recommendation on the cold finished steel bars best suited for your specific operations. Chances are he can speed your production, cut your machining costs. See your local distributor, or write to Jones & Laughlin, 3 Gateway Center, Dept. 563, Pittsburgh 30, Pennsylvania.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

Where cold rolled steels originated in 1859



Final J&L pre-shipment spot inspection

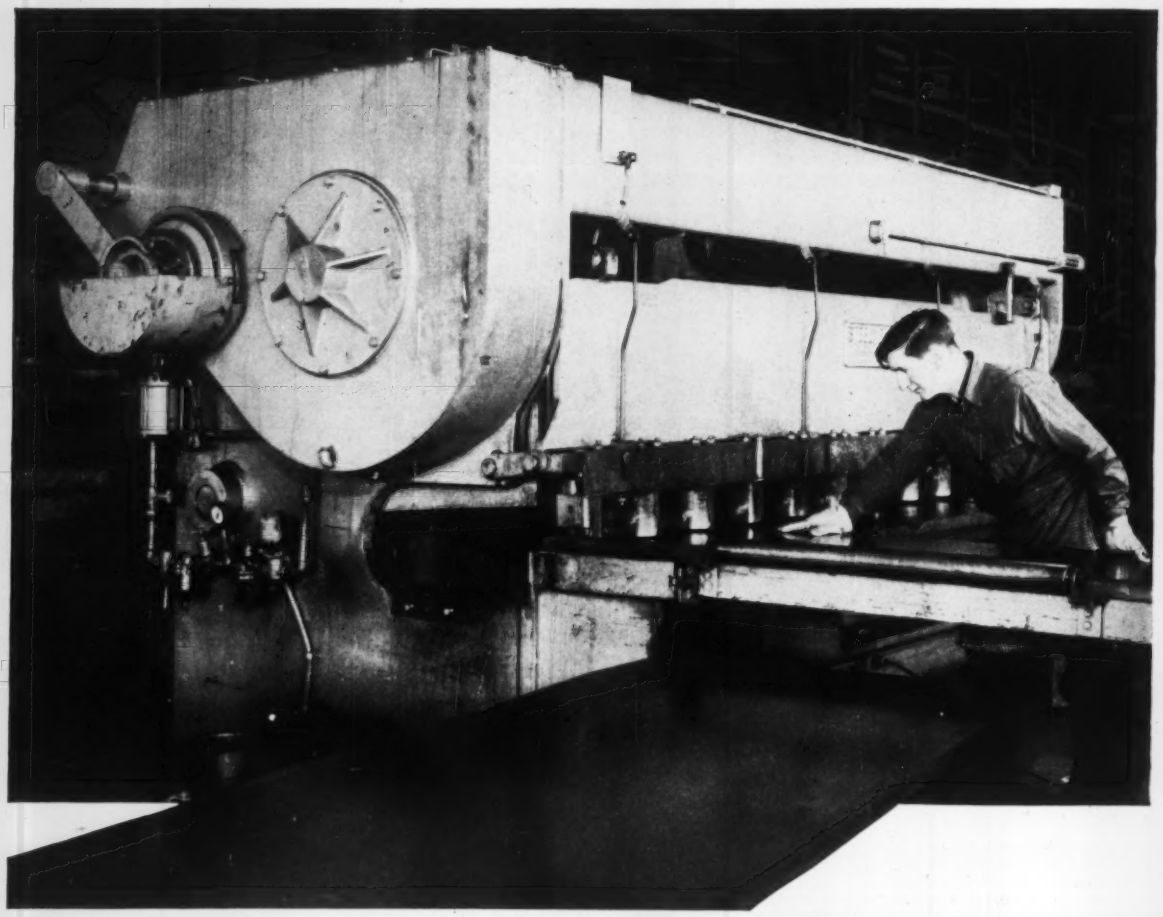
Many bar sizes are used by Porter-Cable

Helical gear cutting hobs last longer

Increased tool life speeds production

High wear resistance is assured

.002 inch clearance between knives produces sharp, straight, accurate edges in the 18 gauge metal cut on this Steelweld Shear. The clearance is easily increased to suit heavier metal. The shear operator is not confined to some average compromise clearance.



Cuts 1200 PIECES Per Hour

Farm Equipment Manufacturer Gets Sharp, Accurate Cuts Because of Steelweld's Exclusive Knife Clearance Adjustment

MASSEY-HARRIS-FERGUSON, Ltd., Toronto, well known throughout the world as a leading manufacturer of farm implements does much of the cutting required for the various steel parts with Steelweld Shears.

Massey-Harris-Ferguson obtains the best possible cuts because the knife clearance can be adjusted exactly to suit the thickness of metal being cut. It is not necessary to depend upon some compromise difficult-to-change knife setting with Steelweld Shears, as they are easily adjusted to the correct clearance in 10 seconds.

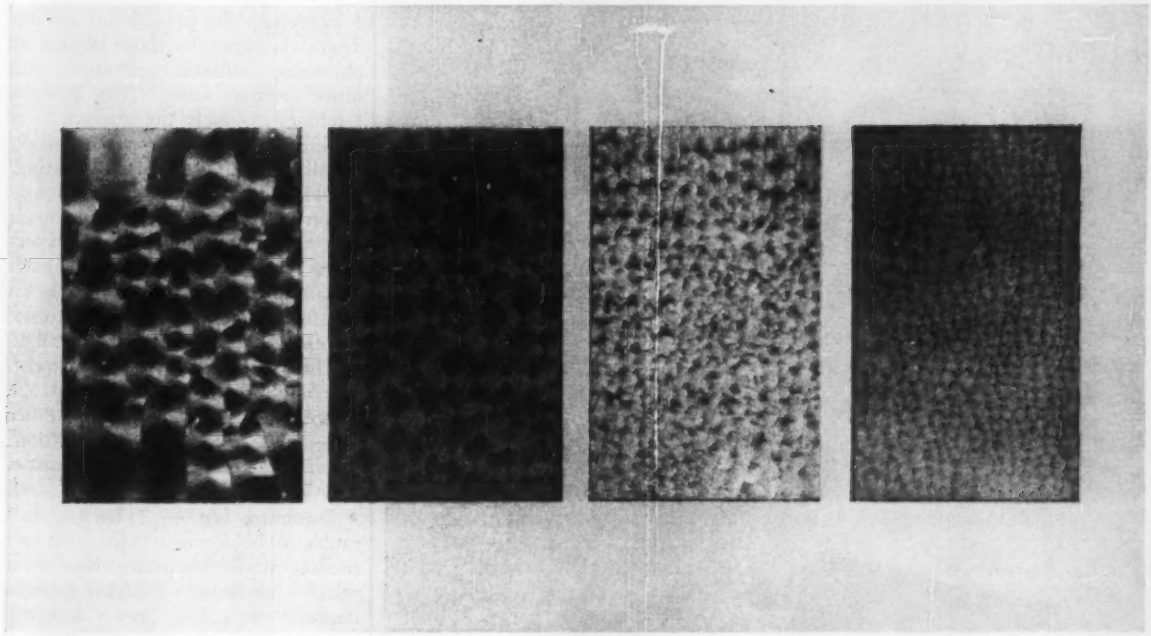
Illustrated is one of the many cutting jobs for which Steelwelds are used. 108-inch lengths of 18 gauge steel are cut into six 18-inch pieces at a rate of 1200 per hour. Knife clearance setting for this work is .002 inch. This shear has been in operation 24 hours a day, six days a week, for many years.

Write for free copy of Catalog No. 2011
Gives construction and engineering details

STEELWELD
PIVOTED BLADE **SHEARS**

STEELWELD DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 7856 E. 282nd ST. • WICKLIFFE, OHIO

Platers Come Up with Patterns



Here are the variety of patterns Oakite calls Kraq-O-Lite finishes. Slight variations in chemical additives and current densities vary the appearances

Nickel platings can be modified into a number of pleasing, decorative designs by a slight change in procedure, says S. S. Frey, Oakite Products Inc., New York

HERE'S a new approach to decorating metals: Pattern plating.

Such electrodeposits can be put on many metals, including copper, brass, and steel. The patterns can be over-plated with chromium, copper, gold, silver, or brass. Deposits can be thicker than 0.1 mil, if you like. Costs: Little more than regular plating.

• Patterns are developed in a nickel bath.

Proprietary nickel baths or a Watts-type bath with a few simple additives are satisfactory for a starting point. If you want to superimpose letters or numbers or some other designs, you work the metal surface before the nickel is deposited.

Metal surfaces must be buffed to a high luster where the pattern is to appear. After degreasing, the bare part is treated cathodically in a good, inhibited electrocleaner (avoid anodic treatment during the cleaning).

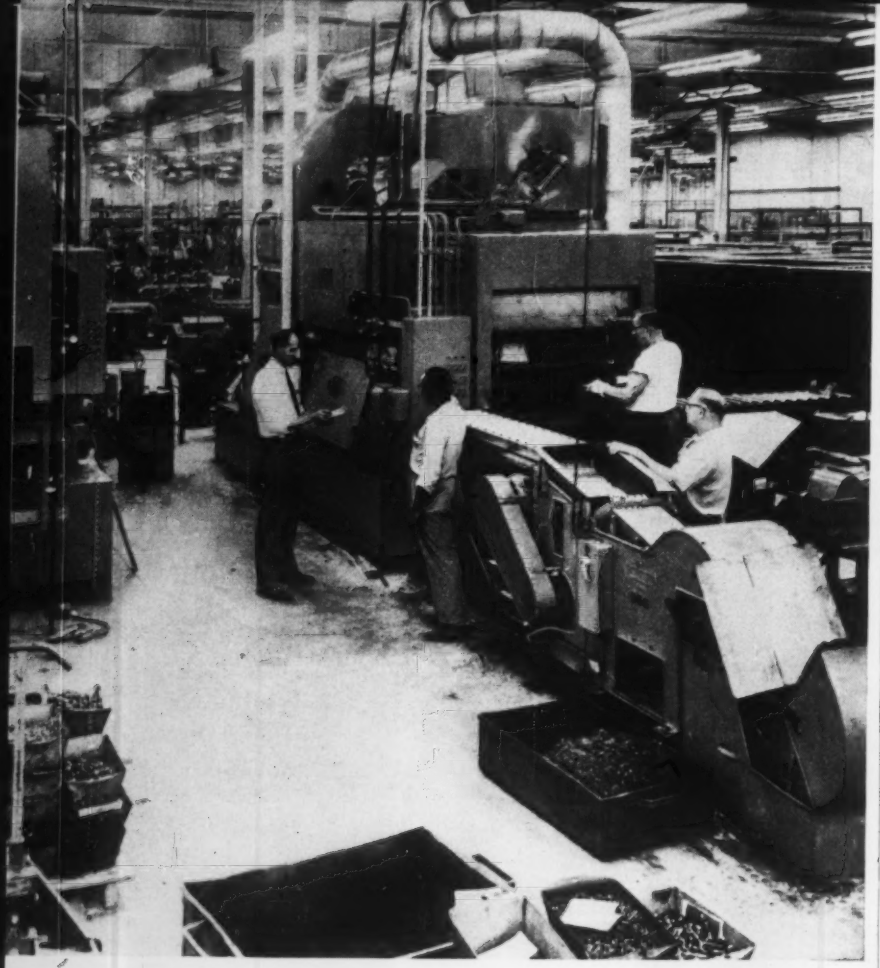
There is the usual rinse and acid dip in sulfuric and hydrochloric acids. After rinsing, parts are placed in an alkaline siliceous bath (pH 10.5 to 11.5). In the bath, parts are the anodes. At low current densities, only 10 to 25 seconds are needed to complete the treatment. Agitation seems to be helpful. The rest of the procedure follows normal nickel plating practice.

A deposit of 0.1 to 0.3 mil is adequate to develop a pattern. Thicker coats diminish intensity; thinner ones won't always develop the patterns adequately. All overplatings of gold, copper, and other metals must be applied thin and bright. Those which can't stand tarnishing or handling should be protected with a lacquer.

Oakite finds that more than 25 seconds only increases the depth of the pattern to a degree which isn't noticeable to the eye. Tests run over a wide variety of temperatures show that 180° F is best. Temperatures above and below that figure were less desirable because of the adverse effect on current densities.

• Chemical and current controls are important to success.

The preparation of the siliceous bath has the greatest effect in producing a suitable film. (Materials include sodium and potassium water glass, sodium meta- and orthosilicates.) Various combinations have been tried together with various salts, hydroxides, and phosphoric

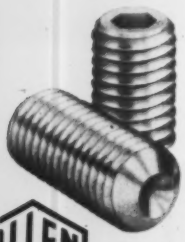


Better Cleaning means Better Socket Screws for You

from ALLEN

These new industrial washing machines wash every Allen product — after each processing operation, and before heat treating — to remove all abrasives and contaminants. After washing, a vibrating de-chipper (shown in the foreground) removes metal particles that may adhere to products in process.

These are among the great many special features in Allen's new plant that assure you of constantly higher quality in socket screws. More than ever, you'll find that ALLEN is the "Buy-Word" for socket screws, as well as keys, dowel pins, and pipe plugs.



The scientific design of the cup diameter on ALLENPOINT Set Screws gives greatly increased resistance to *withdrawal* torque. You can count on Allenpoints to stay tighter longer, under heavy strain and vibrations. This dependable performance is yours to use at no premium in cost. Available in a full range of standard sizes from No. 0 thru 1". For samples and more information, ask your Industrial Distributor, or write direct to The Allen Manufacturing Company, Hartford 1, Connecticut.

ALLEN HEX-SOCKET SCREWS HEAD

acid (the amounts depend on the relative acidity or alkalinity desired).

Control of silicon dioxide is also important.

Current density affects the kind of pattern you get. Great densities make grain sizes larger and denser.

Anions in the conditioner are undesirable, especially those formed by chlorides, sulfates, citrates, and other organic acids. They have a tendency to etch the surface over a wide range of current densities, usually affecting the nickel plating.

Oakite feels that some work agitation is helpful, but how much has to be determined from experience with each batch and each installation. Current reversal is an unknown factor—it helps sometimes; in other cases, it's no help at all.

The anodic film is transparent. You can't see it with a microscope although it will stick to a rubber stamp. Best guess of composition: A form of hydrated silicon dioxide.

• **Summing Up** — "There is still much to be learned before we can predict perfect reproduction of a selected pattern in a nickel electrodeposit," says Mr. Frey. But the problems can be solved without too much difficulty. Probably there ought to be some attention to more sophisticated combinations to achieve stability of the silicated solutions. He believes the answer will be found in an alkaline range of 10.5 to 12.0.

Another area that needs additional work: Round surfaces like tubes and radiuses. It can be done, but patterns aren't quite as pleasing as those deposited on flat surfaces.

New Wetting Agent Ready For Industrial Users

A new wetting agent (Dowfax 2A1) with unusual solubility and stability is suitable for industrial use, says Dow Chemical Co., Midland, Mich.

It may be used in plating and electrolytic cleaning, in vat type alkaline and acid cleaners, or as an ingredient in polishing and buffing compounds.

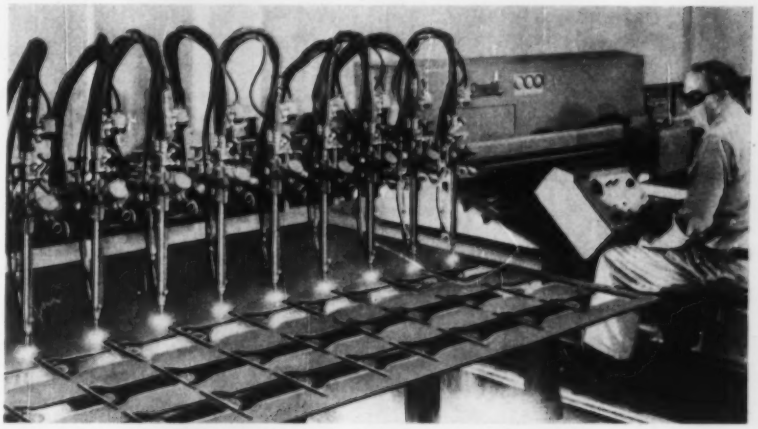
As an additive, it can reduce slurry viscosity, or promote chemical reaction where wetting out is important. It is available as a powder, or solution.

Shape Cutting Machine Has Unlimited Capacity

THOUSANDS of intricate metal parts of any size can be reproduced with a new automated shape cutting machine, the Oxweld CM-60. It has a co-ordinate drive.

The machine can flame cut parts in any thickness of metal (it's limited only by the torches used). Standard models can be equipped with ten torches to cut any width up to 10 ft.

The Oxweld CM-60 has a photoelectric tracing system that automatically compensates for kerf width. Simple pencil or ink sketches of intricate shapes and forms can be used as guides. The Linde Photocell Tracer accurately follows the sketches (including crossing lines), eliminating the need for metal or plastic templates, photographic negatives, or complicated silhouettes.



Another feature of the machine is an automatic height adjustment control on the motor of each cutting torch. The unit rides the plate in front of the torches and senses any deviation in surface levelness. Torches are lowered or raised instantly to compensate for the deviation.

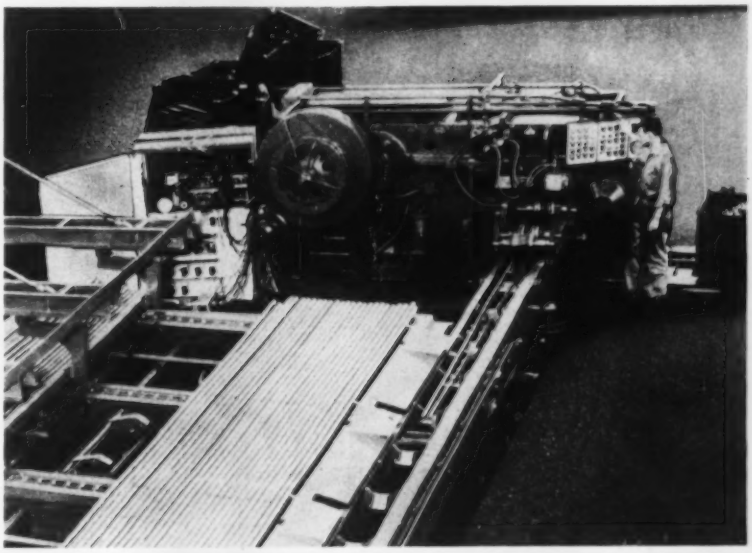
For more information, *write* Linde Co., division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.

Automatic Shear Cuts 2 in. Diameter Bars

ONE MAN oversees the operation of an automatic machine that can shear up to 2 in. diameter high tensile material two pieces at a time. Bars 12 to 50 in. long can be cut into billets; scrap ends of the bars are disposed of automatically.

Open bundles of bars are loaded on a yard conveyor and transferred onto a cross chain magazine. An adjustable scraper mechanism breaks the bundles down into single thicknesses for discharge onto a double grooved feed conveyor. Two bars feed off the conveyor to a length gage which energizes the clutch on the shear, starting the cut.

When the bars are sheared, two more bars are discharged to the feed conveyor producing 50 pieces of cut material a minute. The use of an automatic hold-down eliminates bar kick. Billet deformation is minimized by an outboard support.

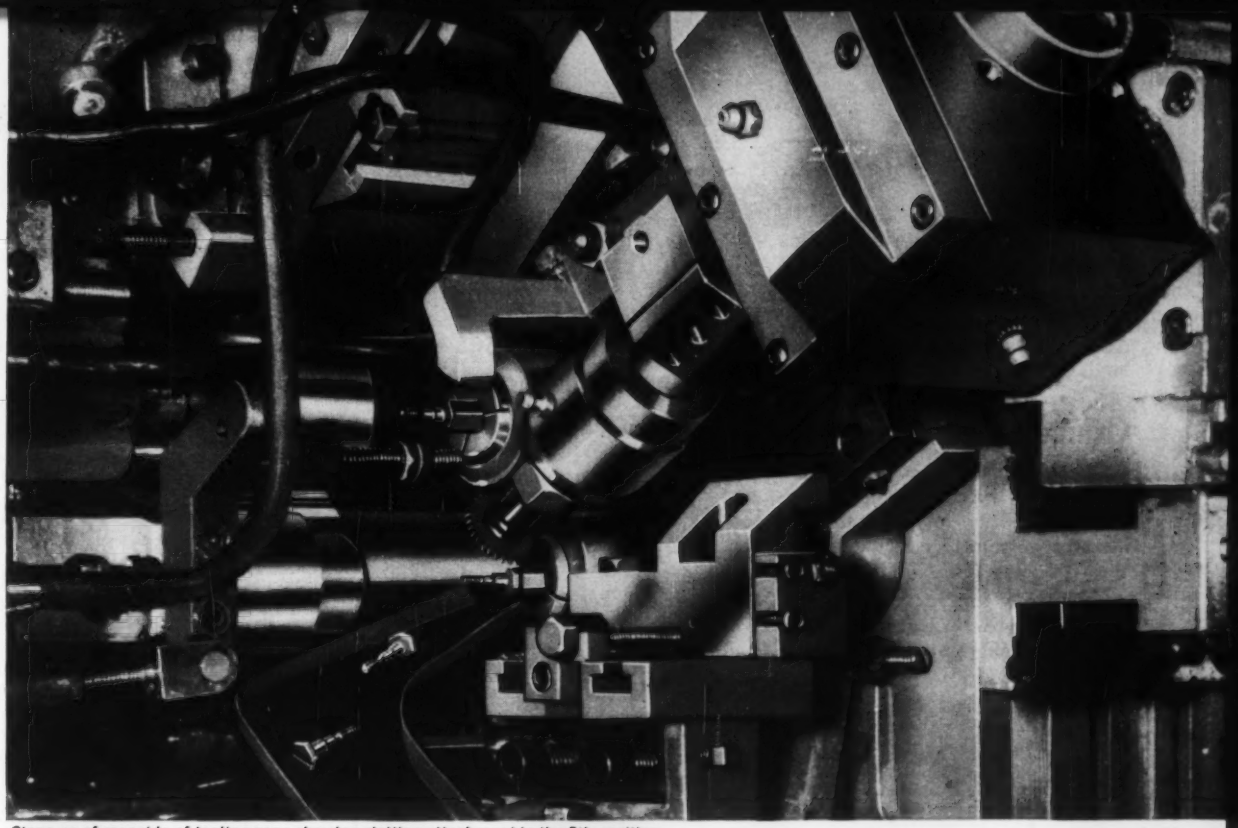


As the billets are sheared, horizontal chains carry them to drop-off chutes for deposit into reciprocating tote boxes and automatically stack the pieces. After each tote box is filled with evenly stacked

First Precision Component
in the Run . . . or Last

An eight unit battery of 7/64" RA-6 Acme-Gridleys.

Acme-Gridleys Sustain Exacting Tolerances for IBM®'s "New Look"

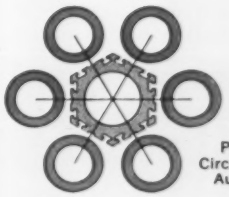


Close-up of rear side of tooling zone showing slotting attachment in the 5th position.

At IBM's modern Lexington, Kentucky plant, twenty Acme-Gridley 7/16" six spindle automatics are mass-producing the small to miniature parts for their sleek new electric typewriter. They help to provide IBM with greater *sustained* accuracy at lower cost than other comparable machines.

The precision components are held to closely controlled tolerances of .0005 t.i.r. These limits apply to the last piece in the run as well as the first, and consistent accuracy is maintained with less machine adjustment than ever before realized. Sustaining the closely controlled tolerances of these parts completely minimizes costly rejections during exhaustive quality control checks of the completed units. Inspection time is greatly reduced.

IBM has also found that the wide-open tooling zone of their 7/16" Acme-Gridleys permits much greater latitude in tooling up for complicated operations performed in a single set-up. This, plus the lasting accuracy of direct camming and the flexibility of independently operated toolslides, makes this newest member of the Acme-Gridley family a profitable asset to IBM's modern production line. Write for Bulletin MRA-58.

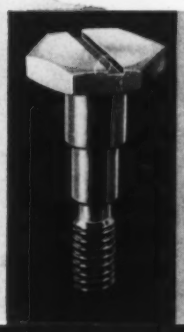


Pioneer in Circumferential Automation

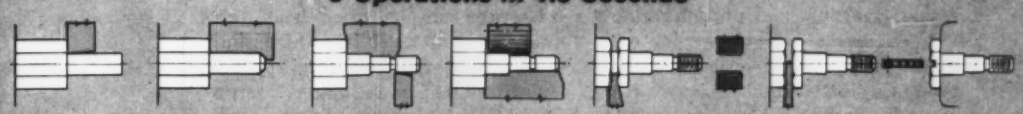
National Acme

The National Acme Company
189 E. 131st Street
Cleveland 8, Ohio

Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.



9 Operations in 4.9 Seconds



6. Rough Turn Front End
1. Rough Form and Chamfer Front End
2. Finish Form Two Diameters Finish Turn Thread Diameter
3. Shave Three Diameters
4. Breakdown for Cutoff–Thread
5. Cutoff–Pickup and Slot

material, it is moved forward by an empty box which starts filling with no interruption of the shear cycle.

For more information, *write* Hill Acme Co., 1201 E. 65th St., Cleveland, Ohio.

Overhead Work Platform

A COMPACT, telescoping work platform for overhead spot maintenance fits inside any normal sized elevator or storage closet and rolls through doorways.

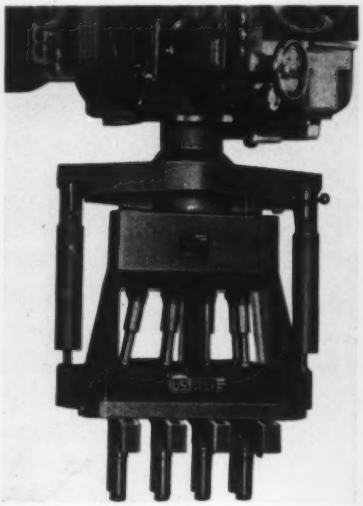
About 6 ft long, 6 ft 7 in. high, and 28 in. wide, it can be extended to reach heights up to 20 ft. Known as the Elevator-Size Tallescope, it is made of aluminum, rolls with the job, and can be quickly assembled by one man.

For more information, *write* Up-Right Scaffolds, 1013 Pardee St., Berkeley 10, Calif.

Attachment Increases Drilling Production

AN ATTACHMENT for adapting large multiple-spindle drilling and tapping heads to radial drilling machines increases production of cumbersome parts.

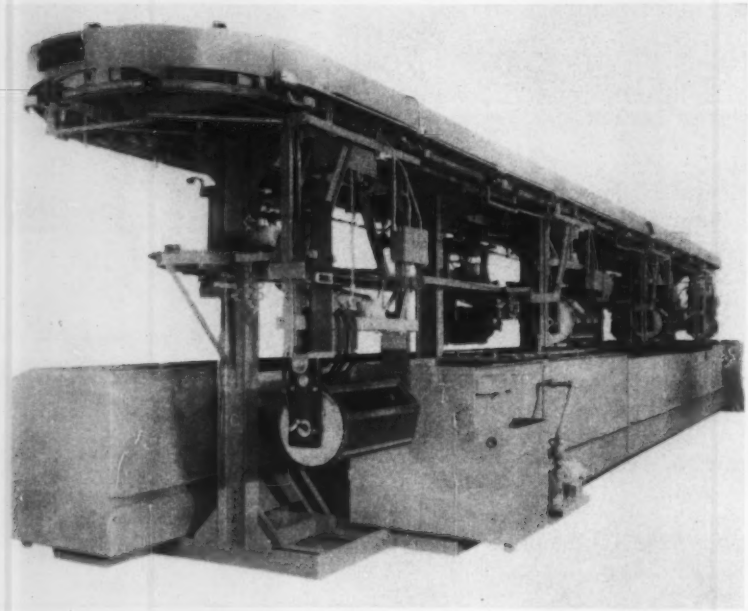
The manufacturer has combined an air counterbalance and a 360 degree, ball bearing, swivel attachment for this purpose. It permits the high versatility of the manufacturer's many sizes of universal joint,



adjustable, multiple spindle, drill heads (as well as fixed center) to be added to any radial.

The resulting flexibility provided in the combination of the radial, the swivel, and the universal joint head is said to afford many cost-reducing factors in drilling structural steel, tube sheets, flue sheets, condenser sheets, and other outsize parts.

For more information, *write* United States Drill Head Co., Cincinnati, Ohio.



Conveyor Increases Process Versatility

WITH the Crown M-P conveyor, production costs can be lowered because the unit can carry on several process jobs simultaneously. You can eliminate downtime for change-overs and increase the speed and scope of processing in plating, anodizing, painting, and phosphatizing.

Each carrier can be set for one of several cycles by automatic programming or manual settings on a control board. Horizontal and oblique barrels, and even racks, can operate on the same machine.

One machine can plate two or three different metals. Rack and barrel work can be plated at two different voltages on the same unit. Work can be plated at four different thicknesses at the same time.

Carriers can be lifted from less than 12 in. up to 12 ft, rotated, and tilted during transfer.

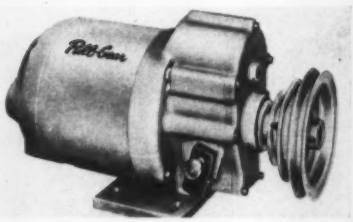
For more information, *write* Crown Rheostat & Supply Co., 1965 Pratt Blvd., Elk Grove Village, Ill.

Motorized Speed Reducer Boosts Machine Capacity

YOU CAN boost the capacity of light-duty, belt-driven machines by adding a finger-tip controlled, quick-change speed reducer.

The precision geared, single-unit type reducer provides extra operating torque at reduced machine speeds on such equipment as drill presses, lathes, and boring mills. The attachment will not overload the machine; it will eliminate the danger of stalling or burning out the machine motor.

The speed reducers bolt directly



L-D PROCESS
BASIC OXYGEN PROCESS
OXYGEN STEELMAKING

Which is which—How do they differ?

In the rapidly broadening use of oxygen in steelmaking, various names have been applied to differing, and even the same, oxygen steel processes.

To clarify terminology, the American Iron and Steel Institute has assigned the description BASIC OXYGEN PROCESS as the generic term for any basic steelmaking process wherein oxygen gas above atmospheric concentration is a dominant factor. The American Iron and Steel Institute definition is "The term 'basic oxygen steel' is used to define a steel which is considered to be the equivalent of basic open-hearth steel, and whose residual nitrogen content is not in excess of 0.007 per cent."

Specification writing societies including the American Society for Testing Materials and the American Petroleum Institute have applied the same terminology. The American Bureau of Shipping has also used the same general terminology with certain added qualifications.

L-D Process Explained

The L-D PROCESS, for which Kaiser Engineers is the exclusive U.S. licensor, is one of these BASIC OXYGEN PROCESSES and the one in widest use today. Of approximately 70 furnaces operating or building within this classification, 62 are the L-D PROCESS type.

(The remaining 8 are rotating vessel processes which should not be confused with the L-D PROCESS.)

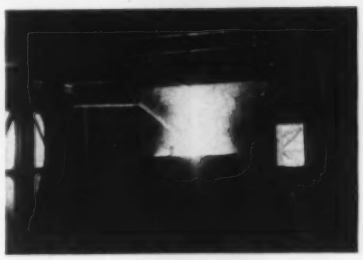
L-D PROCESS is the generally accepted designation of the process where molten pig iron and scrap is subjected to high purity oxygen blown vertically onto its surface in an upright furnace.

L-D PROCESS in action

Charging molten iron

Charging scrap

Blowing



Tapping

L-D Process Advantages

Reasons for world-wide preference of the L-D PROCESS include faster production, better product quality, adaptability to a variety of hot metal analyses, and the low capital investment of about $13 to $15 per annual ingot ton vs. $18 for electric furnaces and $33 for open-hearths.

The L-D PROCESS has also been termed "Linz-Donau" (Linz on the Danube), "Linz-Donawitz," location of the two originating steel plants in Austria and "Linzer Dusenverfahren" which has been interpreted as "Linz Jet Process." Actually, no special significance is attached today in the U. S. to the letters "L-D" other than the fact that they specifically identify, in every part of the world, the generally preferred process for adding new steelmaking facilities.

Complete Steel Plant by KE

Kaiser Engineers designs and builds complete L-D PROCESS installations; also designs and builds complete steel plants including blast furnaces, open-hearth and electric furnace installations, sinter plants, rolling mills, pipe mills, by-products plants, ore beneficiation, air pollution control and water treatment facilities.

For complete new-plant or expansion service, from process design to start-up day, KE offers experience coupled with traditional Kaiser ingenuity. The L-D PROCESS is an example of KE's capability in the application of new developments to the steel industry.

For full information on L-D PROCESS or other KE services in steel plant design and construction, call or write KE at:

Pittsburgh, 330 Grant St., AT 1-7992
New York, 300 Park Ave., PL 9-1100
Oakland, 1924 Broadway, CR 1-2211

KAISER ENGINEERS

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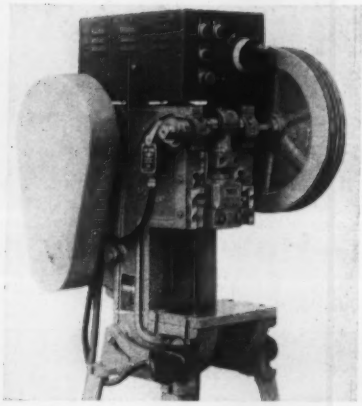
4861

to the standard motor mounting plate. Gear shift controls for changing from high to low machine speeds are reached from either side of the unit. A solenoid coil hookup provides remote control operation.

For more information, *write* Pull-Gear Co., 25425 Mound Rd., Warren, Mich.



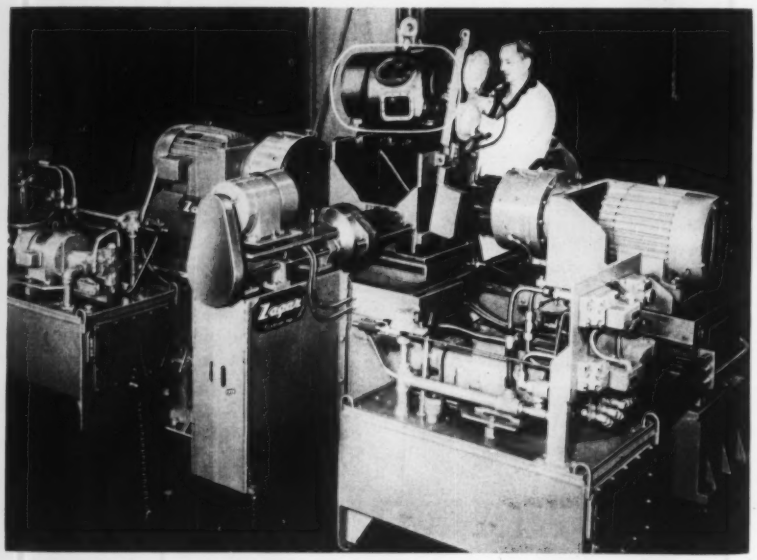
Punch Press Built For Safe Operation

HANDS of the operator are never in danger during the punching period on the 8-ton Electro-Safe punch press, because he must depress two widely separated hand controls and hold them until the ram reaches the bottom of the stroke. He cannot fasten one control in the down position.

A special high-starting torque motor which delivers power directly to the crankshaft eliminates flywheel-in-motion and clutching hazards. In single-trip work, the motor goes dead after every cycle to prevent double tripping. If power fails, a heavy duty brake is applied automatically. Also, the press can be stopped by pushbutton at any point in the stroke cycle.

The press can be locked in any desired setting—continuous, single, inch, or foot control—by authorized personnel. Removal of the key prevents the operator from making improvisations or changes which might endanger him or the machine.

For more information, *write* Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles 22, Calif.



NEW, HEAVY DUTY, 20 HP FEED UNITS are built into this special drilling machine. Three patterns are drilled by each of the four drill heads. The changeable patterns are made by removing the nonoperating drills when a casting and fixture are changed. This feature allows more than one pattern of drilling and tapping to be used when designing machinery. The drill heads are mounted in the form of a cross, the casting being drilled from four sides simultaneously. For more information, **write** Zagar Inc., 24000 Lakeland Blvd., Cleveland 23, Ohio

NEW literature

Write directly to the company for a copy

Chromium Alloying Agent

Iochrome, a 99.997 per cent pure chromium metal, is described in a four-page bulletin. Chromalloy Corp., 450 Tarrytown Rd., White Plains, N. Y.

Material Handling Data

A report covers handling methods related to the production and assembly of truck cranes and other heavy construction equipment, and tells how the firm cut manhours 50 per cent over methods previously used. Job Study 193. Towmotor Corp., Cleveland 10, Ohio.

Gray Iron Buyers' Guide

"Directory and Buyers' Guide," 75 pages lists manufacturers of gray iron castings, and the types and sizes of castings produced. Gray Iron Founders' Society Inc., National City-E. 6th Bldg., Cleveland 14, Ohio.

Indexing Machine Chassis

An 8-page brochure lists advantages of Swanson Series B and C turret type chassis for special purpose processing and assembly machines. Swanson-Erie Corp., 814 E. Eighth St., Erie, Pa.

Speed Reducer Information

A 28-page bulletin, No. 3100, lists the complete line of Falk all-motor and integral motoreducers. Falk Corp., 3001 W. Canal St., Box 492, Milwaukee 1, Wis.

Cemented Carbides Catalog

"Cemented Carbides for Industry" includes an application selector, speed and feed charts, and grade recommendations. Advertising Dept., Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.

Concrete Floor Life

A 24-page bulletin discusses the advantages of Masterplate "iron clad" concrete floors said to last six times longer than ordinary floors. No. MP-4d. Master Builders Co., Cleveland 3, Ohio.

Rubber Fact Book

The 24-page Minnesota Rubber Fact Book provides buyers and engineers with information on industrial O-rings. It also includes specification reference charts, data about media in which various compounds can be used, and other facts concerning rubber. Minnesota Rubber Co., 3630 Wooddale Ave., Minneapolis 16, Minn.

Heat Resistant Finishes

Sicon, a silicone-base heat resistant finish, said to be heat stable up to 1000° F., is described in a brochure. Midland Industrial Finishes Co., Waukegan, Ill.

Surface Finish Control

A 12-page catalog describes a line of Profilometer equipment for measuring surface roughness. Micrometrical Mfg. Co., 345 S. Main St., Ann Arbor, Mich.

32- and 56-inch x 96-inch, 4-high reversing hot strip mill at the Terre Haute plant of Anaconda Aluminum Company.

BLAW-KNOX

ALUMINUM REDUCTION MILLS

Blaw-Knox designs and builds a full range of mills for the reduction of aluminum and other non-ferrous metals. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations and auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron, and steel rolls, Blaw-Knox Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat- and corrosion-resistant alloy castings.

BLAW-KNOX

BLAW-KNOX COMPANY

Foundry and Mill Machinery
Blaw-Knox Building · 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

EXPERT STEELMAKING PROVIDES UNIFORMITY

IN ELECTRICAL SHEETS

Acme-Newport Steel

Electrical equipment is no better than the lamination steel used in its manufacture. At Acme-Newport quality control begins with the melting and continues through every stage of rolling, annealing and processing. Only precision steelmaking can ensure perfect uniformity in each punching, for maximum economy in assembly and performance.

A basic steel producer now in its 74th year, Acme-Newport is well equipped to meet the most stringent specifications.

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

PRODUCTS OF ACME-NEWPORT STEEL

- Hot Rolled Steel in Coil
- Hot Rolled Pickled Steel in Coil
- Hot Rolled Sheets
- Hot Rolled Pickled Sheets
- Cold Rolled Steel in Coil (*full hard only*)
- Cold Rolled Sheets
- Alloy Sheets and Plates
- Plates (3/16" *and lighter*)
- Electrical Sheets
- Electric Weld Line Pipe
- Spiral Welded Pipe

April 27, 1959

Steel Production to Continue at Record Level

LOOK FOR STEEL production to continue at last week's record pace for the remainder of the first half. Mills are booked through June on most products, and consumers aren't about to cancel what they've ordered.

Last week's output was the largest in history. Steelmakers boosted their operations 1.5 points to 95 per cent of capacity and turned out 2,689,000 ingot tons. That's more than twice as much as they made a year ago, when recession-hit production bottomed out at 1,270,000 tons.

SHORT OF CAPACITY—The ingot rate may climb slightly higher before the half ends, but it probably won't hit 100 per cent. Reason: Capacity production would require the use of some high cost, obsolete facilities. Although open hearth furnaces are running full, they can produce only 86 per cent of the industry's rated tonnage. Electric, basic oxygen, and bessemer units make the rest. Since the market for bessemer steels is shrinking, it's unlikely that the idle bessemers will be pressed into service.

DELAYS AT MINIMUM—Although they've had to compress a lot of third quarter business into the first half (customers who fear a strike want their orders shipped before June 30), steelmakers are keeping their commitments. "For once in my life, I can say that we're right on the beam and that we expect to stay there," a sales executive remarks. "We started programing our raw material in December so that no operational problems would prevent us from keeping pace, and we've been quite successful." In Chicago, carryovers are limited to cold-rolled and galvanized sheets. Mills near the Ohio-Pennsylvania border are three or four weeks late on some items because January floods interrupted production. In the face of unprecedented demand, they've had to reduce their order acceptance for the second quarter.

MILLS WARN—Order now—strike or not, it's wise to put orders on the books for the third quarter. If there's a walkout, users who've booked tonnage will have priority on rolling schedules when production resumes. If a strike's averted, third quarter demand may be surprisingly strong because of automotive and construction requirements.

Says Marcus J. Aurelius, administrative vice president of U. S. Steel Corp.: "Assuming that a reasonable settlement can be achieved and that there will be no interruption in steel output this summer, probably the most dangerous decision any steel consumer could make would be to cut back sharply on orders in July and August. Steel use will be at a seasonal high in these months, and it will be the smart buyer who continues to purchase steel to meet consumption needs."

SERVICE CENTERS GAIN—First quarter sales by steel service centers were 15 to 25 per cent better than those of the similar period in 1958. Business will remain strong through the first half and may accelerate in June if consumers can't get enough steel from the mills to replenish their inventories. Sales are best in the Chicago area, where flat-rolled products are in strong demand from auto and appliance manufacturers. Business in New York and New England remains slow. Since the first of the year, distributors have boosted their inventories from 3.3 million to 3.5 million tons.

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*Current prices were published in the Apr. 20 issue and will appear in subsequent issues.

✳ A PERFORMANCE BRIEF

Trackmobile® sends taconite traveling—fast!

Brawniest of three Trackmobile models, this 5TM is one of six operating at a leading taconite mine. This powerful team handles and positions 100 ore-laden cars a day . . . shuttling back and forth over road and rail to keep production moving on schedule. Economical and easy to operate, Trackmobile is ideal for every switching, spotting and hauling assignment.

For the maximum in materials handling efficiency, look to Whiting Trackmobiles, Cranes and Trambeam overhead handling systems. "Performance Briefs," the colorful new booklet of on-the-job reports shows how Whiting equipment helped others solve the problems that could be bothering you. Send for "Performance Briefs" today . . . *Whiting Corporation 15643 Lathrop Ave., Harvey, Ill.*

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

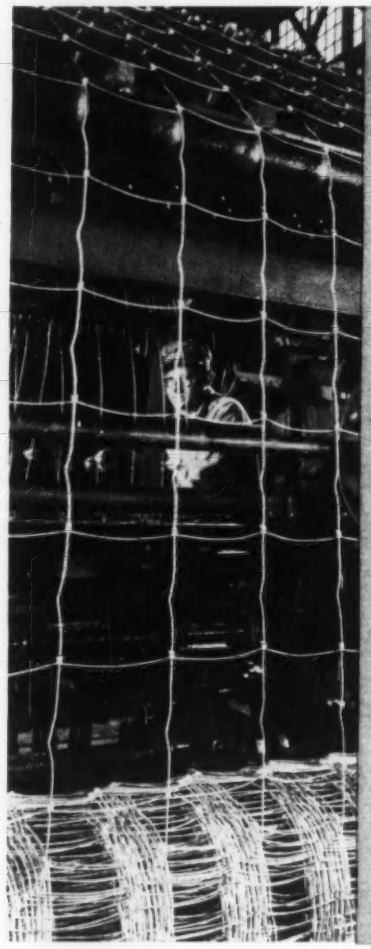
75th year

WHITING

TRACKMOBILE

MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD, AND SWENSON CHEMICAL EQUIPMENT

Behind Woven Wire Fencing Story:



Jones & Laughlin Steel Corp.

In a Decade . . .

Home Shipments Down 56%

Net tons	
1958	157,070
1949	358,162

Exports Down 85%

Net tons	
1958	2,499
1949	16,318

Imports Up 5666%*

Net tons	
1958	39,671
1949	7

*Includes galvanized fencing wire and galvanized wire fencing.

DOMESTIC shipments of wire fence are off about 12 per cent from a year ago, but manufacturers expect to do a little more business this year than they did in 1958. However, they think volume will fall far short of producing capacity because of rising imports and shrinking consumption on the nation's farms.

Dollar volume estimates for 1959 range from $43 million (adjusted to reflect low prices on imports) to $70 million. One producer says the slightly larger volume expected this year (contrasted with 1958's) will fall about $6 million under that of 1957.

• Imports have been taking an increasingly larger share of the American market over the last decade.

Last year, 39,671 net tons of foreign galvanized fencing wire and galvanized wire fencing were brought into this country. That was an increase of more than 5666 per cent over imports of 7 tons a decade ago. Also, it was equal to about 16 per cent of U. S. consumption (barbed and twisted wire and woven wire fence), which amounted to 250,273 net tons (after exports but including imports). Last year's use slid 55 per cent from the whopping market take of almost 557,000 tons in 1949.

Shipments of domestic barbed and twisted wire in 1958 (56,031 net tons) were off 74 per cent from the 1949 total (215,047 tons), while the movement of woven wire fencing (157,070 tons) was down 56 per cent from the 1949 total (358,162 tons).

• Not only are imports cutting into domestic sales, but exports are disappearing.

Right after World War II exports exceeded 10,000 tons annually, amounting to 16,318 tons (woven wire fencing) in 1949. Last year, the total was only 2499 tons.

Manufacturers' efforts to obtain relief from the foreign deluge have come to naught. Last November, several of them initiated a joint ac-

tion before the U. S. Tariff Commission under the escape clause provisions of the General Agreement on Trade & Tariffs. Their plea was based on the wage differential between the U. S. and Western Europe and Japan. The petition sought relief through tariffs and quotas.

• With denial of relief, the problems remain unanswered.

The commission immediately dismissed the application as it applied to barbed wire, ruling that Congress has historically maintained this item on the free list as an aid to the farmer. After formal hearings on nails, staples, woven fencing, and fencing wire (Mar. 3 through 5), it dismissed the application on those products without formal findings. Its reason: It had found it impracticable to treat the domestic products of the producers involved in the action as separate industries.

What the producers' next step will be remains to be disclosed. In a suit in federal court to force the Tariff Commission to hear an escape clause proceeding on barbed wire, the court ruled the commission must review the situation. This may be appealed.

• There are many types of fencing, varying in style and design; each is made in many different sizes and many different materials, including galvanized steel wire, aluminum, and copperclad wire.

Woven fencing is produced on specially constructed and extremely complex machines, from which coils of finished fence emerge ready for market. Fence is produced in four broad categories: 1. Agricultural (livestock, field, and poultry): This type is also used extensively along railroad rights-of-way and superhighways. 2. Ornamental: The bulk of this is used primarily around yards and the like. 3. Chain Link: Made of spirally formed links, it is used largely for factory protection, around utilities, airports, cemeteries, tennis courts, and in similar applications. It is also used along superhighways. 4. Barbed Wire: Much of it goes to farms and ranches. It's made in a great variety of styles and sizes and is also produced on fast running, complex machines.

• Some types of fencing are in better demand than others; the long term downtrend in certain lines continues.

The consensus is that demand for ornamental and chain link fencing is relatively stronger than that for other types. Active residential requirements, to some extent, reflect the flight to the suburbs. Rising vandalism and crime in general are stimulating demand for fencing for plant and property protection. Highway needs are growing in step with modernization of the nation's roads.

The downtrend in agricultural fencing (underway the last seven years) continues. But one producer reports increased activity in hog fencing because of more favorable hog prices in the Midwest and the fact imports have not seriously invaded this area. The manufacturer says demand for poultry fencing is slowest and he finds the Atlantic Seaboard the slowest consumption area—the market is being saturated by imports.

Fencemakers explain the over-all downtrend in agricultural requirements this way: Farm acreage is increasing, but there are fewer farms and farmers. Mechanized farming is exerting an adverse influence on demand; in many areas of the country, farmers are finding it more desirable to increase the size of their fields, which reduces fencing needs.

• Some producers think the downtrend is leveling out.

Still, most of them are quick to point out that, in light of rising imports, and based on current consumption, the industry appears to have too much capacity. One maker says the industry is shipping about 50 per cent of its 1952 and 1953 volume. Another holds that 1958 domestic shipments indicate the tonnage produced was about 25 to 30 per cent of the industry's capacity.

As for the immediate market outlook, manufacturers are not overly optimistic. They say they must have relief from the rising flood of low-priced foreign competition if their market is to attain stability soon. Yet many of them think some upward price adjustments may be necessary this year, depending upon the outcome of pending labor contract negotiations.

FIRST LOAD OF MINNESOTA ORE to be hauled in the 1959 shipping season passed through the Soo Locks Apr. 16 in the hold of the **Philip R. Clarke** of U. S. Steel's Pittsburgh Steamship Div. Close behind the leader of the iron ore armada were the **Cason J. Callaway** and the **Anderson.** Each was bound for South Chicago with 15,500 tons of ore. Note the ice in the canal

Iron Ore . . .

Iron Ore Prices, Page 149

Lake Superior iron ore is beginning to move down the Great Lakes, but it'll be a couple weeks before the movement is in full swing. Ice is hindering traffic.

Ore supplies along the lower lakes are considered adequate, but Inland Steel Co. last week commented that the first 1959 shipment of 16,000

tons which arrived Apr. 11 via the ore carrier *Wilfred Sykes* from Escanaba, Mich., was sorely needed. The company had a record 2,686,000 tons on its docks at the close of the 1958 shipping season, had only 397,000 left. Inland had started to truck to its blast furnaces some of the emergency 360,000 tons stockpiled in East Chicago, Ind.

The company's eight blast furnaces are operating at capacity, consuming 18,000 tons of ore daily.

Blast Furnace Production Sets Record During March

Blast furnace production (7,510,051 net tons of pig iron and ferroalloys) set a record in March, reports the American Iron & Steel Institute. The former monthly record, 7,335,507 tons, was set in December, 1956.

Output in February this year was 6,192,672 net tons; in March, 1958, it was 4,462,740 tons.

First quarter production amounted to 19,963,119 tons vs. about 13.4 million in the corresponding 1958 period.

Blast Furnace Production—March, 1959
(Net tons)

State	March	Year to Date
Massachusetts, New York	479,571	1,238,752
Pennsylvania	1,970,598	5,140,816
Maryland, Virginia, West Virginia	637,680	1,742,573
Kentucky, Tennessee, Texas	155,257	462,107
Alabama	418,437	1,120,757
Ohio	1,436,264	3,751,960
Indiana	875,183	2,420,989
Illinois	658,829	1,695,795
Michigan, Minnesota	482,826	1,304,063
Colorado, Utah, California	395,406	1,085,306
Total	7,510,051*	19,963,118**

*Includes 48,291 tons of ferromanganese and spiegeleisen.
**Includes 142,137 tons of ferromanganese and spiegeleisen.
Data from American Iron & Steel Institute.

Pig Iron . . .

Pig Iron Prices, Page 148

While spotty, demand for merchant pig iron is increasing. April bookings are expected to be the largest of any month so far this year. Buying is hand-to-mouth to maintain consumers' stocks at a steady level. Virtually no buying is for inventory since prompt deliveries are available.

A few foundries have made fairly sizable boosts in operations recently but claim their order books lack the depth they would like. Those serving the railroad equipment and automobile industries are especially busy, as are those which make castings for electric motors going into major appliances. But makers of heavy castings for the construction industry continue to operate at low levels.

The Symington-Gould plant at Depew, N. Y., has lifted its production rate from 50 to 65 per cent of capacity.

Wire . . .

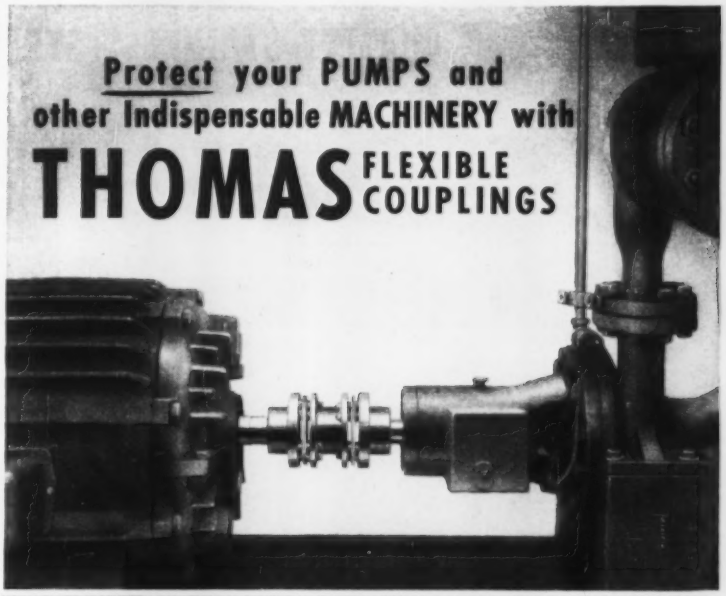
Wire Prices, Pages 143 & 144

Some forward buying of wire and wire products is reported and the mills are fairly well booked up for the remainder of this quarter, but there are still openings in schedules for June shipments in numerous items, including bright basic wire.

Cold heading wire capacity of some makers is virtually taken up for the quarter. The same is true of high carbon spring wire. In New England, heat treating is a bottleneck with some makers.

Prestressed strand is moving actively; so is wire and mesh for reinforcing. With the seasonal pick-up in highwaywork, pressure for steel shipments is increasing.

Heavier consumption of manu-



NO LUBRICATION NO MAINTENANCE NO WEARING PARTS

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.
They will protect your equipment and extend the life of your machines.
Properly installed and operated within rated conditions, Thomas Flexible Couplings should last a lifetime.

UNDER LOAD and MISALIGNMENT ONLY THOMAS FLEXIBLE COUPLINGS OFFER ALL THESE ADVANTAGES:

- Freedom from Backlash
- Torsional Rigidity
- Free End Float
- Smooth Continuous Drive with Constant Rotational Velocity
- Visual Inspection While in Operation
- Original Balance for Life
- No Lubrication
- No Wearing Parts
- No Maintenance

Write for Engineering Catalog 51A
THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

facturers' wire is hampering the buildup of consumers' inventories.

A midwestern wiremaker reports orders have been coming in so fast lately that some couldn't be processed for three or four days. It has often had higher backlogs, but when that condition prevailed, the order flow was at a more even rate.

Merchant wire mills have stepped up their schedules from 15 to 18 turns. Manufacturers' wire mills are on 18 turns for most products, 20 in some instances. By the end of June, shipments are expected to be not more than one week behind.

Consumers seem to be aiming for inventories ranging 30 to 90 days.

Wire volume is expected to show a gain of 5 to 7 per cent this year over that in 1958.

With the opening of the St. Lawrence Seaway, a bulge in receipts of imported merchant wire products is anticipated (chiefly nails, barbed wire, and fence).

No matter which *FINISH* you like—you can buy it in

***MicroRold*® QUALITY STAINLESS STEEL**

2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.

2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.

No. 3—This surface is made by grinding 2B steel with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.

No. 4—A finer finish than No. 3 made by grinding 2B steel with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.

No. 7—Good reflectivity and brilliance made by polishing a No. 4 surface with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.

BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are regularly supplied in all stainless grades (including 18-8 chrome-nickel and 430 straight chromium), with the exception of 430 Bright which is Type 430 exclusively

These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.

Since No. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Department.

WASHINGTON STEEL CORPORATION
42-O Woodland Avenue **Washington, Pennsylvania**

Plates . . .

Plate Prices, Page 141

Platemakers' second quarter schedules are virtually filled on all major grades—sheared, strip-plate, and universal. Some report increasing demand for July shipments; consumers indicate they can use the tonnage if there isn't a strike; and if there is, the commitments will enhance their position for deliveries once the mills resume production.

Some slackening in shipbuilding requirements is noted, but sellers say it is being taken up by larger orders for freight cars. A Texas mill says the demand for plates is setting the pace for other products; merchant bars and structurals run second and third. Mill executives do not anticipate any cancellations if a strike is averted.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 142 & 143

Except possibly for electrical sheets, producers of the light, flat-rolled products are sold out for this quarter. Also, they are in receipt of substantial orders for July shipment.

Reason for continued active ordering: Most consumers are chewing up more tonnage than they had anticipated earlier this year; they've not been able to build inventories as readily as they had hoped. Some are ordering to assure quick deliveries upon resumption of operations after a strike. Should a walkout be averted, they figure they can use the tonnage over the summer anyhow.

Mills that were flooded with orders this spring have had a hard time keeping up with deliveries. One Pittsburgh producer is three to four weeks behind and has had to reduce second quarter acceptances. But at most mills, shipping delays don't exceed three weeks.

Few cancellations have been received; few are expected. Consumption is still picking up; cutting back orders wouldn't make sense. A midwest producer is being pressed for more steel by 80 per cent of his customers.

Autobuilders and their suppliers are the most active consumers.

Demand for galvanized sheets is described by some suppliers as "terrific." Corrugated sheets are mov-

ing in heavy volume, and no sign of slackening is noted. Some new uses for galvanized have been opened up in the home appliance field.

Republic Steel Corp. has issued a revised extra book on electro paintlok, electric zincbond, and electro flashcote sheets. The new card, effective Apr. 8, supersedes one in effect since Feb. 6, 1957. Changes apply on size extras, packaging, and loading.

Distributors . . .

Prices, Page 148

Steel service centers report business this month a little better than it was in March. Hot rolled products and cold rolled sheets are in best demand.

Distributors are disappointed that they have not been the recipients of a larger portion of the heavy business placed by consumers. Most of it went to the mills. Bulk of orders have been placed in anticipation of a possible strike this summer, rather than to cover immediate needs.

Most distributors expect a substantial improvement in their business the next couple of months. This optimism is based largely on the fact mill books are full on most products for delivery through June.

Stainless Steel . . .

Stainless Steel Prices, Page 147

Republic Steel Corp., Cleveland, announced lower prices on stainless steel rerolling billets, effective Apr. 16. The new schedule shows reductions range from 2.75 cents per pound on the 410 grade to 4.25 cents on types 310 and 317:

AISI TYPES	PRICES Cents Per Lb	Reductions Cents Per Lb
201	25.00	3.00
202	28.25	3.25
301	26 00	3.00
302	29.50	3.25
302B	30.75	3.25
304	31.25	3.25
305	34.75	3.50
308	36.25	3.50
309	47.50	3.75
309S	50.25	...
310	59.50	4.25
316	47.50	3.75
317	58.00	4.25
318	64.75	...
321	38.00	3.50
348	50.25	...
410	19.50	2.75
420	31.50	3.25
430	19.75	...

Republic also issued a revised sheet showing changes in its packaging charges. Consumers buying steel on skids or platforms should be familiar with transportation charges for hauling the different types of skids. When a skid is paper wrapped or covered, freight is assessed on the net weight of the steel, plus the weight of the lid or top if specified covered. If a skid is specified with top, side, and end protection of wood or hardboard, the freight is charged on the gross weight of the package; transportation companies consider such packaging to be a box.

Producers are almost sold out for this quarter on flat-rolled stainless products. Some say they could sell twice as much tonnage as they'll be able to make between now and July 1.

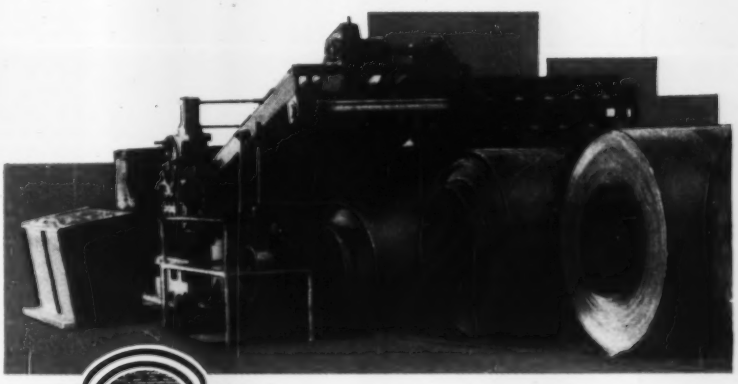
Tin Plate . . .

Tin Plate Prices, Page 143

Tin lines are running at capacity, and producers are predicting a record first half production. They're shipping heavily from inventory and current production as the canmakers step up their releases.

Stamco heavy gauge feeding **equipment and trimmers** save you money.

Saves operating time and increases production. A single operator can quickly feed gauges up to ½" thick with Stamco electrically and hydraulically operated coil strippers and unwind equipment.



Stamco, Inc.
New Bremen, Ohio, U. S. A.

Slitting and Coiling Lines • Cut-To-Length Lines • Flying Shear Lines • Power Squaring Shears • Automatic Resquaring • Corrugating, Culvert and Steel Mill Equipment

This is a picture of a new product

It's nothing you can use in your plant tomorrow — or even next year. But Allis-Chalmers is working on it *now* to meet the needs of industry in the future.

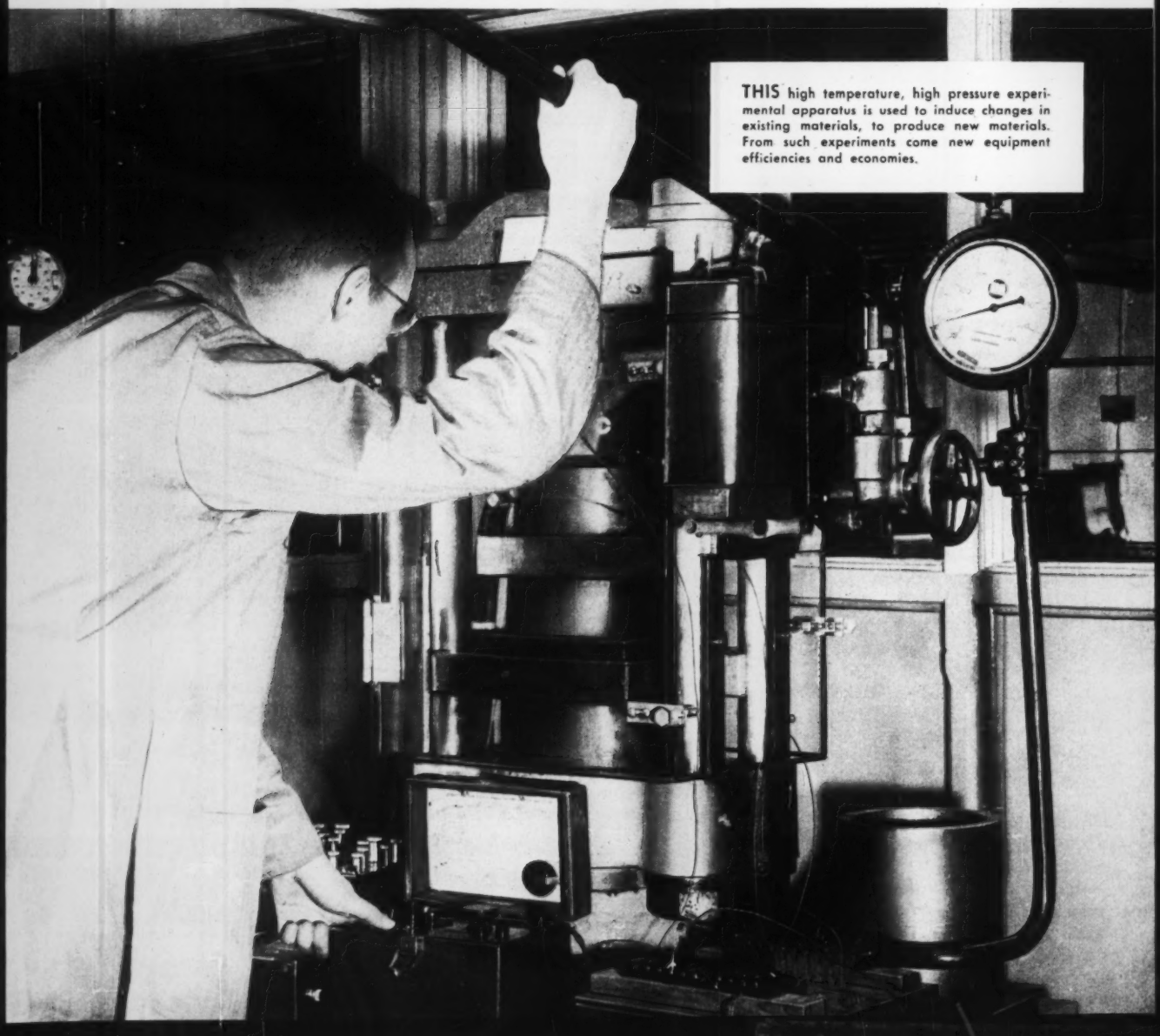
Fundamental research of materials, processes and equipment is an important part of the A-C contribution to industry. *This enables product design engineers to make existing products even better, to create a continuous flow of new equipment, to help industry achieve new efficiencies and economies.*

Research and development are only two reasons why A-C is recognized as a leader in supplying both electrical and mechanical equipment for industry. Single-source availability of "teamed" equipment, maximum engineering help and outstanding service facilities are others.

Talk *to your A-C representative or distributor soon about your requirements. Or write Allis-Chalmers, Milwaukee 1, Wisconsin.*

ALLIS-CHALMERS

A-1004-GI



THIS high temperature, high pressure experimental apparatus is used to induce changes in existing materials, to produce new materials. From such experiments come new equipment efficiencies and economies.

Some consumers expect to have 90-day stockpiles by June 30, but others have been so busy they've been unable to increase their inventories.

Traffiemen at Pittsburgh are having a hard time getting the specialized rail equipment and barges they need.

Metal Can Shipments Off

Shipments of metal cans in February totaled 304,202 net tons, reports the U. S. Bureau of the Census. The January total was 314,161 tons. In February, 1958, the figure was 306,350 tons. The cumulative total for the first two months of this year was 618,363 tons vs. 630,489 in the like 1958 period.

The movement of fruit and vegetable cans in February was 71,876 net tons vs. 71,981 in January, and 79,692 in February a year ago. Shipments in the first two months amounted to 143,857 tons vs. 159,824 in the same period last year.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 142

Seasonal pickup in demand for reinforcing steel is resulting in heavier mill backlogs. That applies not only to re-bars but to wire mesh, both items being in favor for highway construction.

Pending tonnages include 33,000 tons of bars for the Wanapum Dam on the Columbia River, bids May 15.

Tubular Goods . . .

Tubular Goods Prices, Page 147

Demand for continuous buttweld pipe is up considerably. Some makers report more orders on hand than at this time a year ago. Pipe supply houses are replenishing their stocks, anticipating an active demand for gas and water line pipe over coming months.

Oil country goods are moving actively. Some of the improvement in buying is attributed to recently imposed oil import quotas.

Texas has set its oil production allowable on a 12-day schedule for May. It was 11 days in April. The daily allowable will be increased 106,906 barrels to 3,152,765.

Record-breaking drilling operations in the U. S. are reported by Hughes Tool Co., Houston. During the second week of April, 2057 rotary rigs were in operation, an increase of 20 over the preceding week. During the like period of 1958, the count was 1895.

Structural Shapes . . .

Structural Shape Prices, Page 141

Time is running out for fabricators to get additional tonnage on mill books for delivery this quarter. So the threat of a steel strike is no longer stimulating demand to any marked extent.

Business is off in some directions, especially private construction. But delivery promises of fabricators are more extended than they were earlier this year.

Sellers of plain material are booked virtually full for this quarter. Where mill tonnage is needed for a sizable project, late August or early September seems about the best delivery that can be obtained.

Fabricators' backlogs are heavier. In some cases, low prices on fabricated steel make them hesitant about estimating new work.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3000 tons, two powerplants, New York State Power Authority, Niagara County, New York, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

2500 tons, state highway bridges, Fulton-Clayton Counties, Georgia, to Nashville Bridge Co., Nashville, Tenn.; H. M. Pafford Jr., Waycross, Ga., general contractor.

1700 tons, state bridgework, Waterville, Maine, to Bancroft-Martin, Bath, Maine.

1000 tons, eight state highway structures, Prince William-Fairfax Counties, Va., to Montague-Betts Co., Lynchburg, Va.; Guy H. Lewis & Son, McLean, Va., general contractor; reinforcing bars to same shop.

1000 tons, Warren High School, Indianapolis, to Hugh J. Baker Co., Indianapolis; F. A. Wilhelm Construction Co., Indianapolis, general contractor.

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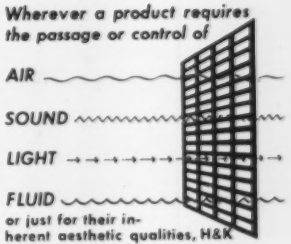
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800 tons, four state bridges, including multiple span beam structures and two single span riveted deck plate girders, interstate route 93, Ammonoosuc River, and over Boston & Maine Railroad, Littleton, N. H., to Phoenix Bridge Co., Phoenixville, Pa.; Landers & Griffin Inc., Portsmouth, N. H., general contractor.

640 tons, launching buildings and facilities, near Warren AFB, Cheyenne, Wyo., to Hammond-Wyoming Co. Inc., Casper, Wyo.; Blount Bros. Construction Co., Montgomery, Ala., general contractor.

530 tons, foundations, Prudential Tower Center, Boston, to Groisser & Schlager Iron Works, Somerville, Wash.; George A. Fuller Co., Boston, general contractor; 29,000 tons, main tower superstructure, to American Bridge Div., U. S. Steel Corp., Pittsburgh.

500 tons, auditorium - coliseum, Knoxville, Tenn., to Lloyd E. Jones Co., Chattanooga, Tenn.; Johnson & Galyon, Knoxville, general contractor.

360 tons, General Stores Supply Office, Navy, Philadelphia, to Meldon Steel Co. Inc., Westbury, Long Island, N. Y.

300 tons, Advanced Electronic Laboratory, General Electric Co., Ithaca, N. Y., through Walter Kidde, engineer, to Ingalls Iron Works, Birmingham.

290 tons, angles, General Stores Supply Office, Navy, Philadelphia, to Phoenix Steel Corp., Phoenixville, Pa.

290 tons, 14 story Westward Hotel, Anchorage, Alaska, to Isaacson Iron Works, Seattle; J. B. Warrack Construction Co., Seattle, general contractor.

270 tons, General Stores Supply Office, Navy, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

235 tons, angles, General Stores Supply Office, Navy, Philadelphia, to Oregon Steel Mills Div., Gilmore Steel Corp., Portland, Oreg.

210 tons, two 3-span composite wide flange beam bridges, Middlesex, Vt., to Vermont Structural Steel Corp., Burlington, Vt.; Rowe Construction Co., Malden, Mass., general contractor.

200 tons, shapes and bars, school and synagogue, Temple Mishkan Israel, Hamden, Conn., to Luria Engineering Co., New York (structurals), and Fox Steel Co., Orange, Conn. (reinforcing); Mariani Construction Co., New Haven, Conn., general contractor.

170 tons, A. J. Wendler Jr. High School, Anchorage, Alaska, to Isaacson Iron Works, Seattle; J. B. Warrack Construction Co., general contractor, low at $1,932,000.

155 tons, angles, carbon, grade M, General Stores Supply Office, Navy, Philadelphia, to Columbia-Geneva Steel Div., U. S. Steel Corp., Washington, D. C.

100 tons, including 80 tons for Methodist College, Alaska, and miscellaneous, to United Iron Works, Seattle.

STRUCTURAL STEEL PENDING

2500 tons, reception building, Bronx State Hospital, bids Apr. 22; medical and surgical building for this hospital was placed with the Lehigh Structural Steel Co., Allentown, Pa., and involved 3000 tons instead of 1200 as previously reported.

1200 tons, laundry and city hospitals, Brooklyn, N. Y., J. P. Carlin, New York, low on the general contract.

1125 tons, three radar towers; bids May 5, U. S. Engineer, Seattle; fabricate and deliver to railheads, Baker and Mt. Hebo, Oreg., and Cottonwood, Idaho, by Aug. 1, 1959.

680 tons, two steel truss state highway spans, Yakima County, Washington; bids to Olympia, Wash., Apr. 28.

525 tons, three steel bridges, Methuen, Mass.; M. DeMatteo Construction Co., Quincy, Mass., general contractor.

375 tons, radar tower, Brunswick (Maine) Air Base; bids to U. S. Engineer, Waltham, Mass.; also, 650 tons, steel sheet piling.

235 tons, three stringer composite beam bridges, Medford-Stoneham, Mass.; bids Apr. 22, Boston; also 100 tons, reinforcing bars.

200 tons, three-span rolled beam bridge, Litchfield-Harwinton, Conn.

200 tons or more, switchyard structures, alternative figures for steel and aluminum; ten bids submitted to Chelan County P.U.D., Wenatchee, Wash., for Rocky Reach power project; referred to Stone & Webster, engineer for analysis.

120 tons, General Stores Supply Office, Navy, Philadelphia, tee sections; bids Apr. 21.

100 tons or more, two railroad overpasses, Silver Bow County, Mont.; lump sum bids for structurals, to Highway Commission, Helena, Mont., Apr. 22.

100 tons or more, addition to Pacific Northwest Airlines hangar, Seattle-Tacoma airport; bids to Diamond Corp., Portland, Oreg., May 15.

100 tons or more, intake gates and hoists, Ice Harbor power project; bids postponed to Apr. 29 (from Apr. 14), to U. S. Engineer, Walla Walla, Wash.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2825 tons, south approach, Seattle freeway, to Mercer Steel Co., Seattle; S. S. Mullen Inc., Seattle, general contractor, low at $2,479,212.

2700 tons, Markland locks and dam, Gallatin, Ohio River, to Laclede Steel Co., St. Louis; J. A. Jones Co., Charlotte, N. C., general contractor.

1445 tons, building, St. Agnes Hospital, Baltimore, to Dietrich Bros. Inc., Baltimore; Consolidated Engineering Co. Inc., Baltimore, general contractor; structurals to the same shop.

1350 tons, launching buildings and facilities, near Warren AFB, Cheyenne, Wyo., to Colorado Builders Supply Co., Denver; Blount Bros. Construction Co., Montgomery, Ala., general contractor.

1050 tons, state highway bridges, Fulton-Clayton Counties, Georgia, to Southern Steel Products Co., Atlanta; H. M. Pafford Jr., Waycross, Ga., general contractor.

685 tons, 17 story apartment building, Beacon Street, Boston, to Joseph T. Ryerson & Son Inc., Boston; Turner Construction Co., Boston, general contractor.

450 tons, dairy products distributing plant, H. P. Hood & Sons, Agawan, Mass., to Scherer Steel Co., East Hartford, Conn.; Daniel O'Connell's Sons Construction Co., Holyoke, Mass., general contractor.

220 tons, drama center, Harvard-Radcliffe, Cambridge, Mass., to Northern Steel Inc., Boston; George A. Fuller Co., Boston, general contractor.

200 tons, auditorium - coliseum, Knoxville, Tenn., to Lloyd E. Jones Co., Chattanooga, Tenn.; Johnson & Galyon, Knoxville, general contractor.

200 tons, Westward Hotel, Anchorage, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Warrack Construction Co., Seattle, general contractor.

130 tons, Washington State highway span, King County, to Bethlehem Pacific Coast Steel Corp., Seattle; Troy T. Burnham, Seattle, general contractor, low at $101,846.

115 tons, Warren High School, Indianapolis, to Holliday Steel Div., Jones & Laughlin Steel Corp., Indianapolis; F. A. Wilhelm Construction Co., Indianapolis, general contractor.

105 tons, two 3-span composite wide flange bridges, Middlesex, Vt., to Vermont Structural Steel Corp., Burlington, Vt.; Rowe Construction Co., Malden, Mass., general contractor.

87 tons, Forest Service laboratory, Missoula, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle.

PLATES . . .

PLATES PLACED

1000 tons or more, 21,000 linear feet, 30-in. steel pipe (caissons) foundations, Tower Building, Prudential Center, Boston, to Bethlehem Steel Co., Bethlehem, Pa.

375 tons, alloy, high tensile, Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., Wilmington, Del., for General Stores Supply Office, Navy, Philadelphia; also, 295 tons of hot-rolled sheets to Bethlehem Steel Co., Bethlehem, Pa., and 250 tons to Weirton Steel Co., Weirton, W. Va.

300 tons, launching facilities, near Warren AFB, Cheyenne, Wyo., to Hammond-Wyoming Co. Inc., Casper, Wyo.; Blount Bros. Construction Co., Montgomery, Ala., general contractor.

205 tons, alloy, high tensile, General Stores Supply Office, Navy, Philadelphia, to Hunterspoint Steel Co., Long Island City, N. Y.; also, 120 tons of sheet steel to same distributor, and 150 tons of sheets to Leifer Bros. Steel Co. Inc., Long Island City, N. Y.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

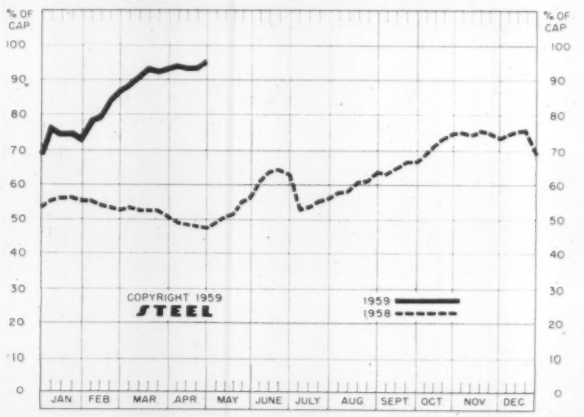
	Week Ended Apr. 26	Change	Same Week 1958	Same Week 1957
Pittsburgh	96	+ 1	47	92
Chicago	96	+ 0.5*	53.5	87
Eastern	96	+ 4	48	96
Youngstown	94	0	44	90
Wheeling	95	+ 1	57	94
Cleveland	98	+ 1.5*	29.5	86.5
Buffalo	102.5	— 1.5	36.5	92.5
Birmingham	93	— 1.5	54	95.5
Cincinnati	96.5	— 2*	29	65
St. Louis	105.5	+ 11*	56.5	94
Detroit	100.5	+ 1*	13.5	96.5
Western	94	+ 1	67	103
National Rate	95	+ 1.5	47	90

INGOT PRODUCTION‡

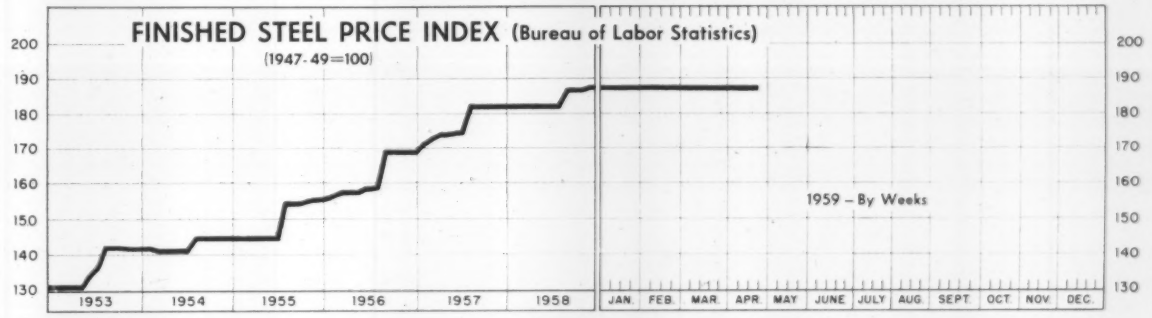
	Week Ended Apr. 26	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	167.0†	165.4	163.8	79.1
NET TONS (In thousands)	2,683†	2,657	2,631	1,270

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Apr 21, 1959	Week Ago	Month Ago	March Avg.	Year Ago
186.7	186.7	186.7	186.7	181.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Apr. 21

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.53
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	27.005	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.665
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.722†
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	April 22 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.70
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	34.67	34.67	39.33	32.83	26.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Not comparable with previous quotation.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	April 22 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	April 22 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gr (including broker's commission)

No. 1 Heavy Melt, Pitts.	$36.50	$36.50	$38.50	$32.50	$26.50
No. 1 Heavy Melt, E. Pa.	33.50	33.50	38.00	36.00	22.00
No. 1 Heavy Melt, Chicago	34.00	34.00	41.50	30.00	29.50
No. 1 Heavy Melt, Valley	37.50	39.50	43.50	32.50	27.50
No. 1 Heavy Melt, Cleve.	35.00	36.00	39.50	29.50	24.50
No. 1 Heavy Melt, Buffalo	34.50	34.50	39.50	26.50	23.50
Rails, Rerolling, Chicago	57.50	57.50	62.50	52.00	39.50
No. 1 Cast, Chicago	44.50	46.50	48.50	38.50	38.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

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PRODUCTION
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GREY IRON CASTINGS

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LARGEST AND MOST MODERN
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ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE

Steel Prices

Mill prices as reported to STEEL, April 22, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 142; footnotes, page 144.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 .. 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 .. 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 99.50
Clairton,Pa. U5 ..... 102.00
Conshohocken,Pa. A3 .. 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 .. 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 .. 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 .... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 .. $119.00
Bridgeport,Conn. C32 .. 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 .. 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 .. 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 .. 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 .. 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 .... 5.05

WIRE RODS
AlabamaCity,Ala. R2 .. 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 .. 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 .... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 .... 6.65
Monessen,Pa. P7 ..... 6.40
N.Tonawanda,N.Y. B11 .. 6.40
Pittsburg,Calif. C11 .... 7.20
Portsmouth,O. P12 .... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 .. 6.40
SparrowsPoint,Md. B2 .. 6.50
Sterling,Ill.(1) N15 .... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 .... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 .. 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 .. 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 .... 5.60
Lackawanna,N.Y. B2 .. 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 .... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 .... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 .. 5.50
S.SanFrancisco B3 .... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 .... 6.20
Weirton,W.Va. W6 .... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2 .. 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 .... 5.55
S.Chicago,Ill. U5 ..... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W6 .... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 .. 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 .. 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 .. 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.05
S.Chicago,Ill. U5, W14 .. 8.05
S.SanFrancisco B3 .... 8.70
Sterling,Ill. N15 ..... 8.05
Struthers,O. Y1 ..... 7.75

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 .. 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 .. 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 .... 6.50
Lackawanna,N.Y. B2 .. 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 .. 6.50
Weirton,W.Va. W6 .... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 .. 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 .. 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 .. 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 .... 5.40
Harrisburg,Pa. P4 .... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 .. 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 .. 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 .... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 .. 5.30
SparrowsPoint,Md. B2 .. 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 .... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 .... 5.30
Youngstown (27) R2 .... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .... 7.05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 .. 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 .. 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 .. 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 7.95
Ind.Harbor,Ind. I-2, Y1 .. 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 7.95
Sharon,Pa. S3 ..... 8.85
S.Chicago,Ill. U5, W14 .. 7.95
SparrowsPoint,Md. B2 .. 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 .... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 .... 7.50
Coatesville,Pa. L7 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana, Calif. K1 .... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 .... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 7.50
Sharon,Pa. S3 ..... 8.40
S.Chicago,Ill. U5 W14 .. 7.50
SparrowsPoint,Md. B2 .. 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 .. 6.375
IndHarbor,Ind. I-2 .... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 .... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 .. 5.55
Ashland l.c.l.(15) A10 .. 6.05
Cleveland c.l. R2 .... 6.05
Warren,O. c.l. R2 .... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 .. 5.675
Aliquippa,Pa. (9) J5 .. 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 .. 5.675
Birmingham(9) C15 .... 5.675
Buffalo(9) R2 ..... 5.675
Canton,O. (23) R2 .... 6.15
Clairton,Pa.(9) U5 .... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 .... 5.675
Emeryville,Calif. J7 .. 6.425
Fairfield,Ala.(9) T2 .. 5.675
Fairless,Pa.(9) U5 .... 5.825
Fontana,Calif.(9) K1 .. 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 .. 5.675
Johnstown,Pa.(9) B2 .. 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5 .. 5.925
Lackawanna(9) B2 .... 5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O. (23) R2 .... 6.15
Midland,Pa.(23) C18 .... 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 .... 6.125
Niles,Calif. P1 ..... 6.375
N.T'wan'a,N.Y.(23) B11 6.025
Owensboro,Ky.(9) G8 .. 6.025
Pittsburg,Calif.(9) C11 .. 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
Riverdale,Ill.(9) A1 .. 5.675
Seattle B3, N14 ..... 6.425
S.Ch'e'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5 .. 5.675
S.SanFran.,Calif.(9) B3 6.425
Sterling,Ill.(1)(9) N15 .. 5.675
Sterling,Ill.(9) N15 .... 5.775
Struthers,O.(9) Y1 .... 5.675
Tonawanda,N.Y. B12 .. 5.675
Torrance,Calif.(9) C11 .. 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 .. 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 .. 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 .. 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 .... 6.975
Lackawanna,N.Y. B2 .. 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 .. 6.725
S.Duquesne,Pa. U5 .... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 .... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 .... 8.55
Lackawanna,N.Y. B2 .. 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14 .. 8.30
S.Duquesne,Pa. U5 .... 8.30
S.SanFrancisco B3 .... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 .. 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9) S5 .. 5.925
Lackawanna(9) B2 .... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 .... 5.675
Tonawanda,N.Y. B12 .. 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 .... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.80
KansasCity,Mo. S5 .... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Loaded (including loaded extra) Carbon
LosAngeles P2, S30 .. 11.75*

Alloy
Ambridge,Pa. W18 .... 10.175
BeaverFalls,Pa. M12 .. 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 .... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2 .. 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.75
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 .. 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2 .. 7.65
Hartford,Conn. R2 .... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 .... 9.10
LosAngeles(49) P2, R2 .. 9.10
Mansfield,Mass. B2 .... 8.20
Massillon,O. R2, R8 .... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 .. 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 ..... 7.90
Putnam,Conn. W18 ..... 8.20
Readville,Mass. C14 .... 8.20
S.Chicago,Ill. W14 .... 7.65
SpringCity,Pa. K3 ..... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willmantic,Conn. J5 .... 8.15
Youngstown F3, Y1 .... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 .. 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 ..... 9.025
Bridgeport,Conn. C32 .. 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 .. 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 ..... 9.025
Hammond,Ind. J5, L2 .. 9.025
Hartford,Conn. R2 .... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 .. 9.025
LosAngeles P2, S30 .... 11.00
Mansfield,Mass. B5 .... 9.325
Massillon,O. R2, R8 .... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.025
Plymouth,Mich. P5 ..... 9.20
S.Chicago,Ill. W14 .... 9.025
SpringCity,Pa. K3 ..... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willmantic,Conn. J5 .... 9.325
Worcester,Mass. A7 .... 9.325
Youngstown F3, Y1 .... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 .....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 .....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14 .5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 .....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ..5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ...6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated; To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ...14.50
McK Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ...5.575
Franklin,Pa. (4)F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ...6.10

SHEETS

SHEETS, Hot-rolled Steel (18 Gage and Heavier)

Lackawanna,N.Y. B2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ....5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.40
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,P... U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 ....7.525
Cleveland J5, R2 ....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 ....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14.7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ...7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland,J5, R2 .....6.275
Conshohocken,Pa. A3 .6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 ....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ...7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 ....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....9.275
Cleveland J5, R2 ....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 ..... 9.275

SHEETS, Culvert	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky.	A10 7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875†
Ashland,Ky. A10 ...6.875†
Canton,O. R2 .....6.875†
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ...6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ....6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 ....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 ....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W. Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 ....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K3 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.
O4 Oregon Steel Mills

P1 PacificStates Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp., Sub. of Barium Steel Corp.
P5 Pilgrin Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain&Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7 J5	7.425
Dearborn Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15 90	18.85
Bristol Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12 60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn.Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15 60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15 60	....
Farrell,Pa. S3	8.95	10.40	12.60	15 60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16 10	19 30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12 90	15 90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12 60	15 60	....
NewHaven.Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	...	10.70	12 90	16 10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.10	12.60	15 60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15 60	18 85
Sharon,Pa. S3	8.95	10.40	12.60	15 60	18.55
Trenton,N.J. R5	...	10 70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10 70	12 90	15 90	18.75
Warren O. T5	8.95	10.40	12 60	15 60	18.55
Worcester Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol.Conn. W1	...	18.85	22.95	27.80
Buffalo W12	...	18.85	....	....
Fostoria O. S1	...	19 05	22.15	....
FranklinPark.Ill. T6	...	19.20	23 30	28.15
Harrison.N.J. C18	...	18.55	22.95	27.80
NewYork W3	...	18.85	22.95	27.80
Palmer.Mass. W12	...	18.85	....	....
Trenton N.J. R5	...	18.85	22 95	27.80
Worcester.Mass. A7, T6	...	18 85	22.95	27.80
Youngstown S41	...	19.20	23.30	28.15

Weirton W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover.O. G6	7.425*
Evanston.Ill. M22	7.525*
McKeesport.Pa. E10	7.50*
Riverdale.Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester.Mass. A7	7.975
Youngstown S41	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell.Pa. S3	7.50
Sharon.Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell.Pa. S3	5.525
Riverdale.Ill. A1	5 675
Sharon Pa. S3	5.525
Youngstown U5	5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa.Pa. J5	$9.10	$9 35	$9.75
Fairfield Ala. T2	9.20	9.45	9.85
Fairless.Pa. U5	9.20	9 45	9 85
Fontana,Calif. K1	9.75	10 00	10.40
Gary.Ind. U5	9.10	9 35	9 75
GraniteCity.Ill. G4	9.20	9 45	9 60
IndianaHarbor,Ind. I-2, Y1	9 10	9.35	9.75
Irvin.Pa. U5	9.10	9.35	9.75
Niles.O. R2	9.10	9 35	9 75
Pittsburg.Calif. C11	9.75	10 00	10 40
SparrowsPoint.Md. B2	9.10	9 35	9.75
Weirton.W.Va. W6	9.10	9 35	9 75
Yorkville O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)

IndianaHarbor Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles.O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa.Pa.J5	$10 40	$10.65
Fairfield Ala. T2	10.50	10.75
Fairless.Pa. U5	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary.Ind. U5	10 40	10 65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11 30
Sp Pt.,Md. B2	10.40	10.65
Weirton.W.Va.W6	10.40	10.65
Yorkville,O. W10	10 40	10.65

BLACK PLATE (Base Box)

Aliquippa.Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin Pa. U5	8.20
Niles O. R2	8.20
Pittsburg Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton.W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa.Pa. J5	7.85
Gary Ind. U5	7.85
GraniteCity.Ill. G4	7.95
Ind Harbor.Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	....	9.975*†	11.30* 12.00*	13.15*	....
IndianaHarbor,Ind. I-2	....	9.875*†	11.20* 11.90*	13.05*	....
Mansfield,O. E6	....	9.875*†	11.70 12.40	13.55	14.65
Newport,Ky. A2	....	9.875	11.70* 12.40*	13.55*	14.65*
Niles,O. M21	....	9.875*†	11.70 12.40	13.55	....
Vandergrift,Pa. U5	....	9.875*†	11.70 12.40	13.55	14.65
Warren,O. R2	....	9.875*†	11.70 12.40	13.55	14.65
Zanesville,O. A10	....	....	11.70† 12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)

Grain Oriented	T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler Pa. A10	....	....	....	19.70	20.20	20 70 ....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70†

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. MS	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12 65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12 90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12 65
Muncie,Ind. I-7	13.60
NewHaven Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg Calif. C11	13.45
Portsmouth,O. P12	12 65
Roebling,N.J. R5	12 95
SparrowsPt.,Md. B2	13 50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12 95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9 95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W2	10.05
Pittsburg Calif. C11	10.70
Portsmouth O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. MS	16 40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo Ind. C16	16 30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer Mass. W12	16.60
S SanFrancisco C10	17.15
Waukegan Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth O. P12	13.45
Roebling,N.J. R5	13.75
St.Lou's L8	13.45
SparrowsPt. Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ..$10.30

NAILS, Cut (100 lb keg)
To Distributors (33)

Wheeling,W.Va. W10..$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler
[illegible] Ga.(per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga. Col.

Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	----
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	----
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	----

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	----
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70§§
Struthers,O. Y1	9.00	9.65†
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter ..	55.0
3¼ in. thru 6 in. ..	50.0
Longer than 6 in. ..	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in. ..	40.0
Longer than 6 in. ..	31.0
¾ in. thru 1 in.:	
6 in. and shorter ..	37.0
Longer than 6 in. ..	31.0
1¼ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter ...	55.0
3¼ in. thru 6 in. ..	50.0

Carriage Bolts
Full Size Body (cut thread)& Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter ..	48.0
Larger diameters and longer lengths ...	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter ..	48.0
Larger diameters and longer lengths ...	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam..	43.0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy	
Hot Pressed & Cold Punched:	
⅜ in. and smaller..	62.0
⅞ in. to 1⅛ in., incl.	56.0
1⅛ in. and larger ..	51.5
Hex Nuts, Semifinished, Heavy (Incl. Slotted):	
⅜ in. and smaller..	62.0
⅞ in. to 1⅛ in. incl.	56.0
1⅛ in. and larger	51.5
Hex Nuts, Finished (Incl. Slotted and Castellated):	
⅞ in. and smaller..	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger..	51.5
Semifinished Hex Nuts, Reg. (Incl. Slotted):	
⅝ in. and smaller..	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger..	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:	
6 in. and shorter:	
½ in. and smaller..	35.0
¾, ⅞, and 1 in. ..	16.0
Longer than 6 in.:	
½ in. and smaller..	3.0
¾, ⅞, and 1 in. ..	+11.0
High Carbon, Heat Treated:	
6 in. and shorter:	
½ in. and smaller..	20.0
¾, ⅞, and 1 in. ..	+ 5.0
Longer than 6 in.:	
½ in. and smaller..	+19.0
¾, ⅞, and 1 in. ..	+39.0
Flat Head Cap Screws:	
¾ in. and smaller, 6 in. and shorter ..	+85.0
Setscrews, Square Head, Cup Point, Coarse Thread:	
Through 1 in. diam:	
6 in. and shorter ..	+ 5.0
Longer than 6 in. ..	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85
7/8 in. and smaller by 6 in. and shorter: 15.0%.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	----
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	....	43.40	55.40	73.00	....
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

	Standard		Tee Rails	
Rails	No. 1	No. 2	All No. 2	60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....(16)†	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Labanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) 3/8" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.028"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

carefree is stainless steel

The gleaming efficiency of Stainless housewares is a joy to every woman. Everything made of Stainless Steel cleans with ease, lasts a lifetime and brightens-up the home.

No other metal offers the freedom of design and fabrication, economy of care and the durable beauty that serves and sells like Stainless Steel.

McLOUTH STEEL CORPORATION, Detroit 17, Michigan

specify

McLOUTH STAINLESS STEEL

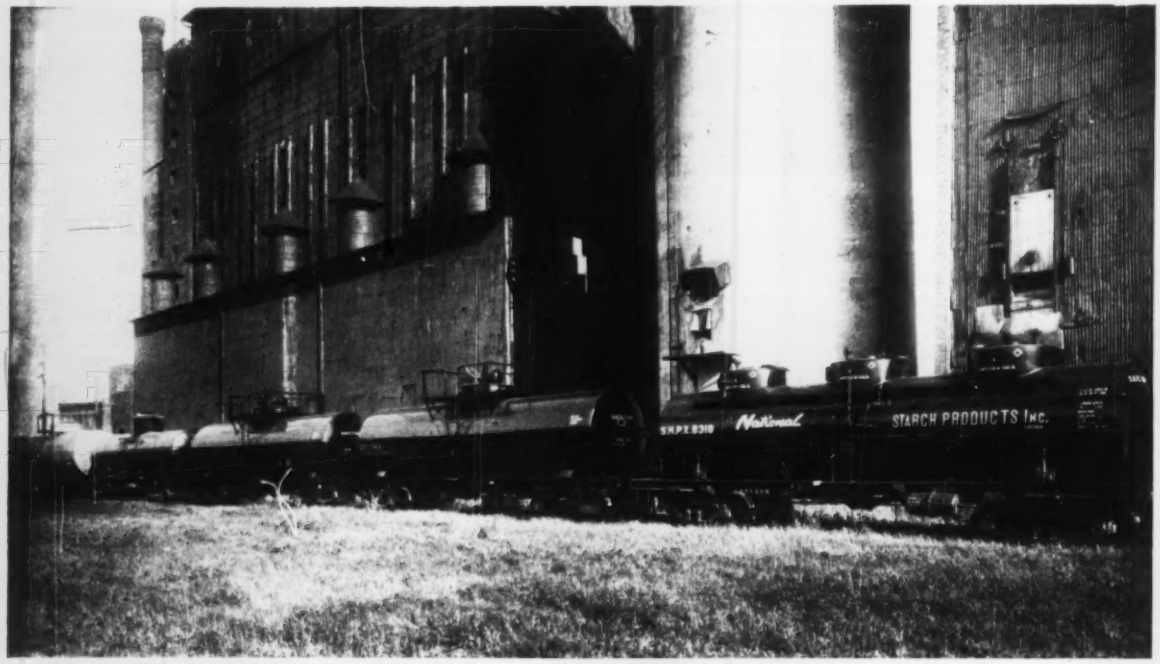
HIGH QUALITY SHEET AND STRIP

for homes and home products

HERESITE

REG. U. S. PAT. OFFICE

LININGS FOR TANK CARS AND STEEL TANKS



HERESITE INDUSTRIAL COATING P-403 IS A BAKING TYPE PURE PHENOL FORMALDEHYDE RESIN MATERIAL

After proper application and baking, the HERESITE lining is odorless, tasteless and non-toxic. The smooth glass like surface is easily cleaned and sterilized.

Since 1946 over 1500 tank cars have been lined with HERESITE for transporting sulfuric, acetic and lactic acids, latex, formaldehyde, solvents, food products and many other commodities.

FABRICATION

Steel tanks built to your specification at Manitowoc, Wisconsin are HERESITE lined—we ship directly to destination.

You save time, shipping cost and production problems.

May we have your inquiry? Catalog No. 57 mailed if requested on your letterhead.

HERESITE & CHEMICAL COMPANY

MAIN OFFICE & PLANT—MANITOWOC, WISCONSIN

EASTERN DIVISION—GARWOOD, NEW JERSEY

Canada: Dominion Rubber Company, Ltd.
Montreal, Quebec

Europe: Aluminium-Schweisswerk A. G.
Zurich, Switzerland

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.75	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates: Carbon Base 5%	10%	15%	20%	Sheets: Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.80	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base: Cold Rolled 10%	Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y. deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn I3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]	Structural Shapes	Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85 #	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30 #	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25 #	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; # net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill. Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Curtner, Calif., $185; Canon City, Colo., $183.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gilbsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe: Minimum trucklots, freight allowed east of Mississippi River:	
100 mesh, 100 lb bags	11.25
100 mesh, 100 lb pails	9.10‡
40 mesh, 100 lb bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	

	Dollars
Aluminum: Atomized, 500-lb drum, freight allowed	
Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.40-50.90†
Bronze, 5000-lb lots	52.20-56.20†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	52.80-57.20†
Phosphor-Copper, 5000-lb lots	64.60
Copper (atomized) 5000-lb lots	45.10-53.60†
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten: Carbon reduced, 98.8% min, minus 65 mesh	nom.**
1000 lb less 1000 lb	2.80 2.95
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.40	$5.40	$5.30	$5.75
Bar Size Angles	5.10	5.10	5.00	5.43
Structural Angles	5.10	5.10	4.90	5.43
I-Beams	5.11	5.11	5.01	5.45
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.37	6.37	6.37	6.69
Sheets, H.R.	8.25	8.25	8.25	8.55
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.55	6.55	6.55	6.90
Merchant Bars	5.35	5.35	5.30	5.85
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.19	5.32	5.14	5.49
Wire Rods, O.H. Cold Heading Quality No. 5	5.09	6.22	6.04	6.34
Bright Common Wire Nails (‡)	7.85	7.75	7.67	8.20

†Per 82 lb net reel. ‡Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$10.75-11.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $0.915-$0.965 per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00
South African Transvaal	
44% no ratio	19.75-21.00
48% no ratio	29.00-31.00
Turkish	
48% 3:1	51.00-55.00
Domestic Rail nearest seller	
18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	15.50
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max) Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 800 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c, less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload bulk 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ¼" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb. of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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Scrap Price Decline Is Checked

STEEL's composite on No. 1 heavy melting steel holds unchanged at $34.67, but market tone continues weak. Buying test is lacking at most consuming points

Scrap Prices, Page 154

• **Pittsburgh**—No. 1 dealer bundles dropped $1 a ton when an independent steelmaker bought scrap for May delivery at $39. Brokers thought the figure a good one in view of the market's depressed state. No. 2 bundles went to the same purchaser for $25 delivered, off $2. There's little demand for No. 1 heavy melting scrap in spite of its attractive price ($37) and the high level of steel production.

• **Chicago** — Leading open hearth grades of scrap are holding recently established price levels, but prices on blast furnace and cast grades have slipped another $1 to $2 a ton. The market is weak, with material readily available and mill buying limited.

• **Philadelphia** — Prices are unchanged, except for structurals and plates which are now quoted $40-$42. Business is still declining.

Export business provides one area of optimism in the market. One vessel left here last week for Japan, and two more (possibly three) are expected to leave within the next month; one vessel reportedly is destined for Formosa.

• **New York**—The market is drifting. It's on about the same level as a week ago. Brokers' buying prices are unchanged. In some grades, notably No. 2 bundles and machine shop turnings, prices are nominal. In most items, there's just enough business going to sustain the market. This is true in the cast and stainless specialties also.

• **Cleveland**—Despite the high level of steel production (98 per cent of capacity here and 94 per cent in Youngstown) demand for scrap continues to lag. Further weakening in prices may be experienced at monthend when new auto lists come out. The last sale of No. 1 steel in the Valley was at $40 a ton, down about $8 in a little over a month.

• **Detroit**—Prices are steady with orders lacking. Dealers and brokers are waiting for monthend auto lists; they expect bids will be off $1 to $2 a ton, and that dealers' prices will drop another 50 cents to $1.

• **Cincinnati**—The market is sluggish. There has been no buying to test prices. But district mills are expected to enter the market this week for their May requirements. Brokers are quoting $34-$35 on No. 1 heavy melting steel.

• **Buffalo**—Improved weather has increased collections and processing in this area; dealers report a seasonal pickup in across-the-scale receipts. But the movement is less-

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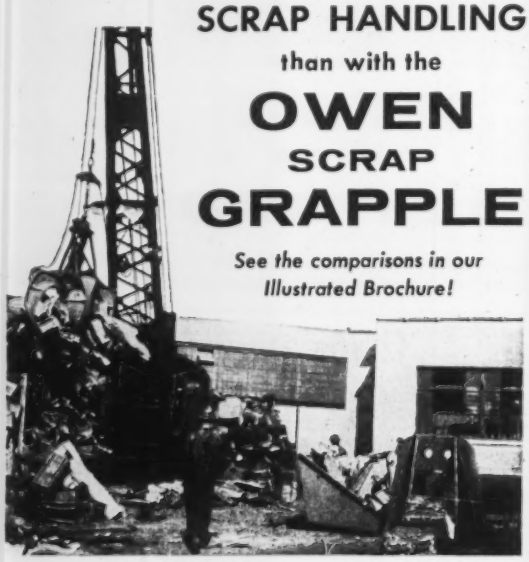

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than-average for the season. Dealers are marking time as they await placement of May orders. Meanwhile, the market is steady, but the price trend will depend on May tonnage placements. Cast scrap prices are softer.

• **St. Louis** — Yard receipts are down, and the railroads are withdrawing a number of items from their monthly lists because of the low prices offered. Only stove plate is scarce. No. 1 heavy melting steel is off $1 a ton to $34, and No. 2 heavy melting is down $2, being quoted at $31. Several rail scrap categories are off $1 to $2.50 a ton, with sales limited. Brokers do not anticipate much change in market conditions before fall.

• **Birmingham**—Dealers have cut their buying prices in line with expected reductions to consumers. Result: Less tonnage is being generated. Supplies are adequate for current requirements, and sellers are holding high priced tonnage in the hope demand will improve before the quarter ends.

• **Houston**—Brokers' buying prices on heavy melting steel are off $2 a ton on the basis of a local mill purchase for delivery May 15 to June 15. An old order from this mill, calling for delivery by May 15, is about filled.

The new purchase dropped brokers' prices to $34 for No. 1 heavy melting, and $31 for No. 2 heavy melting.

Western Gulf export buying is slow. The only significant buying reported was in Mobile, Ala., where f.a.s. prices were quoted at $35 for No. 1 heavy melting, $32 for No. 2 heavy melting, and $22 for No. 2 bundles. The accumulation is for June shipment.

The Texas industry and major consumers are opposing a legislative proposal to levy a 5 per cent gross receipts tax on all kinds of scrap. The proposal has been approved by the House Revenue & Taxation Committee in the state legislature.

• **San Francisco** — Although the mills are not taking much tonnage, the market is firm, buoyed by export demand.

• **Los Angeles**—The mills are buying sparingly, leaning heavily on inventories. However, prices are unchanged. Collections are up slightly and supplies are considered substantial.

• **Seattle**—The market is steady. Trading has increased and prices are firmer. No. 1 heavy melting is quoted $37, No. 2 heavy melting $34, and No. 2 bundles, $26.

Scrap Use Tops Pig Iron For First Time in Months

Despite fewer days in February, consumption of metallics (scrap and pig iron) during the month increased 3 per cent over the January figure and was the largest total (11,285,000 gross tons) for any month since May, 1957, reports the U. S. Bureau of Mines.

Scrap consumption (5,654,000 tons) exceeded pig iron consumption (5,631,000 tons) for the first time since June, 1958. Of the total metallics melt, 50.1 per cent was

(*Please turn to Page* 159)

Iron and Steel Scrap Statistics—February, 1959

(In thousands of gross tons)

SOURCES: Purchased scrap receipts, home and purchased scrap consumption, scrap stocks—Bureau of Mines; steel mill consumption—American Iron & Steel Institute; Exports—Department of Commerce.

	PURCHASED SCRAP		HOME AND PURCHASED CONSUMPTION			CONSUMPTION
1959	Receipts	Consumption*	Total	Steel Mill	Foundry	No. 2 Bundles‡
February	2,264	2,321	5,654	4,531	1,123*	309**
January	1,996††	2,088††	5,375	4,294	1,081	289††
1958						
December	2,218	2,259	4,974	3,922	1,052	296
November	2,248	2,265	4,804	3,819	985	298
October	2,132	2,298	5,091	4,064	927	294
September	1,935	2,025	4,472	3,502	970	235
August	1,814	1,943	4,203	3,346	857	236
July	1,577	1,655	3,717	2,941	776	217
June	1,622	1,867	4,409	3,528	881	246
Totals 1958	20,767	22,127	50,243	39,264	10,979	...

	——SCRAP STOCKS—— HOME AND PURCHASED		STOCKS	Licensed	
1959	Steel Mill	Foundry	No. 2 Bundles‡	For Export	Exports
February	6,916†	1,178†	...	250	237
January	7,172††	1,159††	682	231	197††
1958					
December	7,358	1,208	708	231	127
November	7,094	1,209	728	31	201
October	6,879	1,164	688	154	228
September	6,903	1,145	679	194	197
August	6,817	1,133	654	156	151
July	6,814	1,111	600	130	176
June	6,768	1,096	563	218	220

*Estimated.
†Estimated from AISI data.
‡Includes small amounts of No. 3 and incinerator bundles.
††Revised.
Data from Institute of Scrap Iron & Steel Inc.

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, April 22, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Apr. 22	$34.67
Apr. 15	34.67
Mar. Avg.	40.40
Apr. 1958	33.08
Apr. 1954	25.67

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	32.00-33.00
No. 1 dealer bundles	*38.00-39.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	36.00-37.00
No. 1 factory bundles	45.00-46.00
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals:	
2 ft and under	46.00-47.00
3 ft lengths	45.00-46.00
Heavy turnings	34.00-35.00
Punchings & plate scrap	*46.00-47.00*
Electric furnace bundles	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Random rails	52.00-53.00
Railroad specialties	47.00-48.00
Angles, splice bars	51.00-52.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	120.00-125.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	35.00-36.00
No. 1 hvy melt., dealer	32.00-33.00
No. 2 heavy melting	*29.00-30.00*
No. 1 factory bundles	*38.00-39.00*
No. 1 dealer bundles	33.00-34.00
No. 2 bundles	22.00-23.00
No. 1 busheling, indus.	35.00-36.00
No. 1 busheling, dealer	32.00-33.00
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Cut structurals, 3 ft	*39.00-40.00*
Punchings & plate scrap	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Stove plate	*41.00-42.00*
Unstripped motor blocks	*34.00-35.00*
Clean auto cast	*51.00-52.00*
Drop broken machinery	*51.00-52.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00*
R.R. malleable	56.00-57.00
Rails, 2 ft and under	52.00-53.00
Rails, 18 in. and under	53.00-54.00
Angles, splice bars	48.00-49.00
Axles	66.00-67.00
Rails, rerolling	57.00-58.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-225.00
18-8 turnings	120.00-125.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*37.00-38.00*
No. 2 heavy melting	28.00-29.00
No. 1 busheling	*37.00-38.00*
No. 1 bundles	*38.00-39.00*
No. 2 bundles	*23.00-24.00*
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	*38.00-39.00*
Electric furnace bundles	*38.00-39.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*

CLEVELAND

No. 1 heavy melting	*34.50-35.50*
No. 2 heavy melting	24.00-25.00
No. 1 factory bundles	*39.00-40.00*
No. 1 bundles	*34.50-35.50*
No. 2 bundles	24.00-25.00
No. 1 busheling	*34.50-35.50*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	*35.00-36.00*
Cut structurals, plates 2 ft and under	*42.00-43.00*
Low phos, punchings & plate	*35.50-36.50*
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	*35.50-36.50*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	50.00-51.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*34.00*
No. 2 heavy melting	*31.00*
No. 1 bundles	37.00
No. 2 bundles	23.00
No. 1 busheling	37.00
Machine shop turnings	16.00
Short shovel turnings	18.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	50.00
Stove plate	45.50

Railroad Scrap

No. 1 R.R. heavy melt.	39.00
Rails, 18 in. and under	*50.00†*
Rails, random lengths	*44.00*
Rails, rerolling	*56.00†*
Angles, splice bars	44.00

BIRMINGHAM

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	30.00-31.00
No. 2 bundles	21.00-22.00
No. 1 busheling	30.00-31.00
Cast iron borings	14.00-15.00
Machine shop turnings	*22.00-23.00*
Short shovel turnings	*23.00-24.00*
Bars, crops and plates	40.00-41.00
Structurals & plates	39.00-40.00
Electric furnace bundles	36.00-37.00
Electric furnace:	
2 ft and under	34.00-35.00
3 ft and under	33.00-34.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	*39.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18 in. and under	49.00-50.00
Rails, rerolling	52.00-53.00
Rails, random lengths	41.00-42.00
Angles, splice bars	43.00-44.00

PHILADELPHIA

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	36.00-37.00
No. 2 bundles	21.00-22.00
No. 1 busheling	35.00-36.00
Electric furnace bundles	38.00-39.00
Mixed borings, turnings	20.00†
Short shovel turnings	23.00-24.00
Machine shop turnings	19.00†
Heavy turnings	32.00-33.00
Structurals & plate	*40.00-42.00*
Couplers, springs, wheels	42.00-43.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	43.00
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	27.00-28.00
No. 2 bundles	17.00-18.00†
Machine shop turnings	10.00-11.00†
Mixed borings, turnings	13.00-14.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plates)	35.00-36.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	34.00-35.00
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
Mixed borings, turnings	19.00-20.00
Machine shop turnings	17.00-18.00
Short shovel turnings	21.00-22.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	51.00-52.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	27.50-28.50
No. 1 bundles	34.00-35.00
No. 2 bundles	21.00-22.00
No. 1 busheling	34.00-35.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings	18.00-19.00
Cast iron borings	17.00-18.00
Low phos., 18 in.	43.00-44.00

Cast Iron Grades

No. 1 cupola	43.00-45.00
Heavy breakable cast	39.00-40.00
Charging box cast	38.00-39.00
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 18 in. and under	54.00-55.00
Rails, random lengths	47.00-48.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	*34.00*
No. 2 heavy melting	*31.00*
No. 1 bundles	*34.00*
No. 2 bundles	22.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	*41.00*

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	26.00-27.00
No. 1 busheling	26.00-27.00
Machine shop turnings	8.00-9.00
Short shovel turnings	12.00-13.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	19.00-20.00
No. 1 bundles	30.00-31.00
No. 2 bundles	17.00-18.00
No. 1 busheling	27.00-28.00
Machine shop turnings	*12.00-13.00*
Mixed borings, turnings	*12.00-13.00*
Short shovel turnings	*13.00-14.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Stove plate	30.00-31.00
Charging box cast	*31.00-32.00*
Heavy breakable	*31.00-32.00*
Unstripped motor blocks	19.00-20.00
Clean auto cast	43.00-44.00

SEATTLE

No. 1 heavy melting	*37.00*
No. 2 heavy melting	*34.00*
No. 1 bundles	29.00†
No. 2 bundles	*26.00*
Machine shop turnings	17.00
Mixed borings, turnings	17.00
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	*17.00*
Machine shop turnings	15.00
Shoveling turnings	18.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	34.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

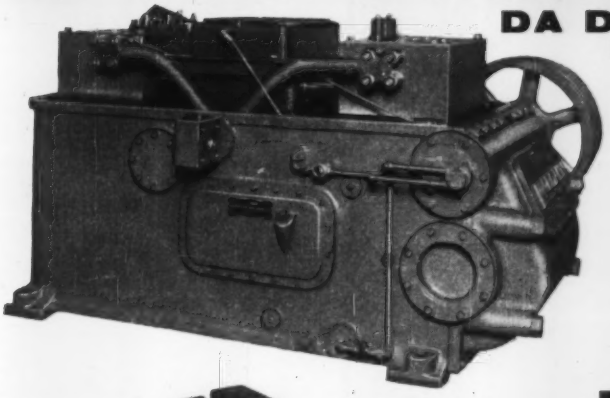
No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	
Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

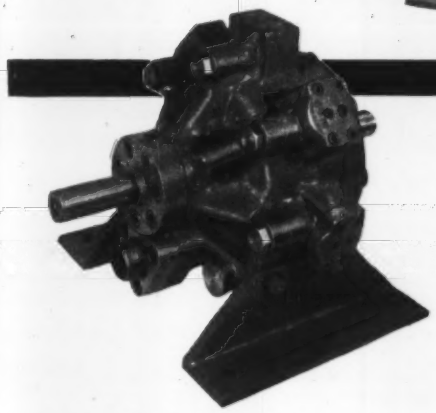
†Nominal.
‡F.o.b. Hamilton, Ont.

LOGEMANN HIGH PRESSURE PUMPS



DA DUMPS . . . *Opposed cylinder, Reciprocating-plunger, double pressure type.*

Logemann DA Pumps are close-coupled to occupy minimum floor space. They have six plungers, operating three each in two cylinder blocks. In double pressure applications both cylinders deliver large fluid volume to a common discharge line, up to a predetermined low pressure. The low pressure cylinder is then automatically cut out by an adjustable unloading valve and high pressure cylinder continues to deliver fluid until maximum pressure is reached. Pumps are equipped with anti-friction bearings and automatically lubricated by combination splash and pressure system fed by a lubricating pump. Are totally enclosed, with cover provided for inspection and maintenance. Drive is through multiple V-belts for quietness. Available in various sizes.



RA PUMPS

84 GPM for pressures up to 1500 psi
42 GPM for pressures up to 3000 psi

These are radial rotary plunger type pumps with hydraulically operated suction and discharge valves. Both are totally enclosed and extremely compact for limited space conditions. Seven plungers. Cylinder, plungers and valves are Nitralloy. Crankshaft rotates on tapered roller bearings and is counterweighted to minimize vibration. Drive from motor is through flexible coupling.

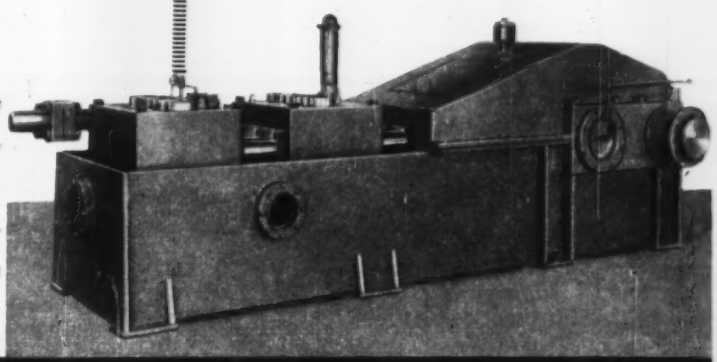
14-AX High Pressure Test PUMP

This is a vertical triplex type for pressures as high as 50,000 psi. —and is extensively used on pressure and burst tests. Short plunger stroke and low crankshaft speed reduces fluid delivery for easy observation of gauges and control during pressure tests. Designed for use with water, has non-corrosive cylinder block, and the plungers, valves and valve seats are Nitralloy. This type is also obtainable for lower pressures and for other applications such as press operation.

145-A PUMP

Horizontal triplex tandem type

Designed to deliver high gallonage (371 GPM) at pressures up to 1000 psi and reduced gallonage (128 GPM) between 1000 and 3000 psi. Changeover from low to high pressure is made by an automatic unloading valve. Crankshaft, connecting rods and drive are enclosed in an oil-tight, dust-proof cover. Gears are continuously sprayed with oil under pressure; connecting rod bearings are pressure lubricated; and crosshead slides operate in an oil bath. The lubricating oil is pump circulated, and all cylinders are machined from solid steel blocks. This tandem type is also obtainable in smaller sizes.



LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 45, WISCONSIN

OCDM Move Jolts Copper

Plan calling for sale of 128,000 tons of stockpile metal frightened marketers and aroused ire of Congress. Most of hysteria has passed. Lead price is up

Nonferrous Metal Prices, Pages 158 & 159

WANT A RECIPE guaranteed to brew confusion?

Take an industry that has been on the verge of boiling over several times in the last few months. Then take a government bureau which has control over a sizable amount of the industry's product, and casually announce you are considering dumping this material on the market.

That's what the Office of Civil & Defense Mobilization did recently when it indicated it would release 128,000 tons of copper from the Defense Production Act inventory—without consulting users and producers and over the objections of copper-savvy people in government.

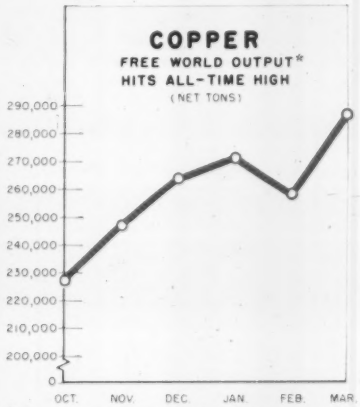
• **Result** — The announcement caught the industry by surprise. One government man says it "was one of the best kept secrets since the atomic bomb." And like the A-bomb, the explosion was heard around the world. Prices plummeted overseas. Activity on the commodity exchange virtually dried up. Scrap and ingot prices fell.

• **Why**—OCDM had one motive and that was to get money into the treasury. Certainly, the average consumer of copper wouldn't benefit from such a move right now. Here's why: A sudden government disposal program could only result in the domestic price falling. This would cut the value of inventory many users have built up as a hedge against a possible midsummer strike.

Another thing: While copper's tight in this country, there's no shortage. In fact, a look at the broad picture shows Free World output hit an all-time high last month (see graph) while stocks rose to 319,184 tons.

• **Reaction**—Angry mine state senators were at work before the ink had dried on OCDM's announcement. Fifteen legislators fired a letter to OCDM's director, Leo A. Hoegh, demanding among other things that he announce no copper would be sold. Shortly after, the entire Senate voted a resolution opposing any stockpile sale.

The amazing thing is that OCDM didn't pull a full scale retreat. It did clarify its position by issuing a statement that "if and when" it decides to release copper, disposal will be only 5000 tons a month.



* Both primary and secondary crude production.
Source: Copper Institute.

• **Countermove**—The Senate isn't satisfied. A spokesman reports the Interior Committee staff has been instructed to draw up legislation that would prohibit OCDM from doing anything without Congressional sanction.

Probably the senators won't ask the metal be placed in the strategic stockpile from where it could only be removed if Congress were to declare a national emergency. They'll want to set up some sort of machinery where the copper could be released by Congress or a Congressional committee if a strike were to bring about a shortage.

Lead Climbs to 11.5 Cents

The volatile lead market took a step upward on Apr. 20 when producers boosted the price by 0.5 cent to 11.5 cents a pound.

Sparking the move was an improvement in sales. Custom smelters' business was exceeding their intake of scrap and concentrates.

Aluminum Output Spirals

Production of primary aluminum continues its march toward an all-time record year. March output hit a record high of 157,189 tons. First quarter production, which totaled 456,013 tons, also was a record.

On May 1, Kaiser Aluminum & Chemical Corp. will start up the third potline at its Ravenswood, W. Va., works. It will add 36,250 tons yearly to domestic output. STEEL estimates that after this date the U. S. primary industry will be operating at an annual rate of 1,863,250 tons.

NONFERROUS PRICE RECORD

	Price Apr. 22	Last Change	Previous Price	Mar. Avg	Feb. Avg	Apr., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	31.50-32.50	Apr. 21, 1959	31.50-32.00	32.031	30.159	24.323
Lead	11.30	Apr. 20, 1959	10.80	11.238	11.368	11.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.50	Apr. 22, 1959	102.25	103.000	102.364	93.021
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.409	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

PROJECT ALERT AT WORK FOR YOU

FIRST: Udylite introduced its plating barrel reconditioning and replacement plan. It has worked and is working, just as promised, for the many customers who have taken advantage of this service.

SECOND: Udylite offered an unmatchable service for modernizing old rectifiers to give them the benefit of the latest high efficiency rectifier developments.

THIRD: *Now*, Udylite offers a *no charge* technical service for the inspection of your Udylite Full Automatic machines and the recommendation of what is needed to put them in top operating conditions.

THE PLAN AND THE PROMISE:

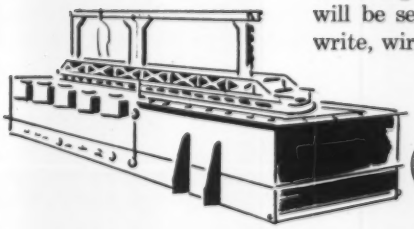
Your Udylite representative will call on you and offer this special service:

1. A factory-trained service man will call at your plant, at your convenience, to determine if your machines need service and/or parts.
2. If they are needed, he will give you, *at that time*, a quotation at the special low prices established for this Project Alert program.
3. On your acceptance of the quotation, parts will be shipped promptly from a special department at Udylite. When they arrive at your plant, the Udylite service man will return and supervise your people in their installation.

THE ADVANTAGES:

1. Complete machine inspection without charge to you.
2. Immediate and complete quotation, if work or parts are needed.
3. Udylite factory supervision in your plant.

All three Project Alert plans are working. And all their advantages are yours for the asking. Your Udylite man will be seeing you soon. But if you need prior service, write, wire or call us *today*.



the **udylite** corporation

detroit 11, michigan • world's largest plating supplier

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 32.50; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.30; chemical, 11.40; corroding, 11.40, St. Louis, New York basis, add 0.20.

Lithium: Cups or ingots, 50-100 lb, $10 per lb, f.o.b. Minneapolis; 100-500 lb, $9.50 per lb deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $240-245 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.50

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 13.50; No. 2, 14.00; No. 5, 13.75 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 19.75.

Brass Ingot: Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245 ,35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.50-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.080-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .082 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-.30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 24.50-25.00; No. 2 heavy copper and wire, 22.50-23.00; light copper, 20.50-21.00; No. 1 composition red brass, 19.00-19.50; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes
Copper	55.63b	52.86c	....	55.82
Yellow Brass	48.24	32.73d	48.78	51.65
Low Brass, 80%	51.23	51.17	51.77	54.54
Red Brass, 85%	52.29	52.23	52.83	55.60
Com. Bronze, 90%	53.90	53.84	54.44	56.96
Manganese Bronze	56.54	50.14	60.62	....
Muntz Metal	50.85	46.16	....	....
Naval Brass	52.80	46.61	59.36	56.21
Silicon Bronze	60.67	59.86	60.21	78.35
Nickel Silver, 10%	63.82	66.15	66.15	....
Phos. Bronze	75.34	75.84	75.84	77.02

SCRAP ALLOWANCES e (Based on copper at 31.50c)

	Clean Heavy	Clean Rod Ends	Clean Turnings
Copper	27.500	27.500	26.750
Yellow Brass	20.625	19.750	18.750
Low Brass, 80%	23.250	23.000	22.500
Red Brass, 85%	24.250	24.000	23.500
Com. Bronze, 90%	25.125	24.875	24.375
Manganese Bronze	19.125	18.875	18.375
Muntz Metal	19.375	19.125	18.625
Naval Brass	19.125	18.875	18.375
Silicon Bronze	27.000	26.750	26.000
Nickel Silver, 10%	25.500	25.250	12.625
Phos. Bronze	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20 000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 18.00-18.50; new brass clippings, 17.50-18.00; light brass, 13.00-13.50; heavy yellow brass, 14.00-14.50; new brass rod ends, 15.00-15.50; auto radiators, unsweated, 14.50-15.00; cocks and faucets, 15.50-16.00; brass pipe, 15.50-16.00.

Lead: Soft scrap lead, 7.50-8.00; battery plates, 2.25-2.50; linotype and stereotype, 8.75-9.25; electrotype, 7.25-7.75; mixed babbit, 8.75-9.25.

Monel: Clippings, 26.00-28.00; old sheets, 23.00-25.00; turnings, 20.00-21.00; rods, 26.00-28.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 38.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 3.00-3.25; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.25-6.75; segregated low copper clips, 13.00-13.50; segregated high copper clips, 13.00-13.50; mixed low copper clips, 12.00-12.50; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.75-12.25; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.75-17.25; segregated high copper clips, 15.75-16.25; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.25-15.75.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.50-15.00; segregated high copper clips, 13.00-13.50; mixed low copper clips, 13.50-14.00; mixed high copper clips, 12.50-13.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 27.75; No. 2 heavy copper and wire, 26.25; light copper, 24.00; refinery brass (60% copper) per dry copper content, 25.75.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 27.75; No. 2 heavy coopper and wire, 26.25; light copper, 24.00; No. 1 composition borings, 20.50; No. 1 composition solids, 21.00; heavy yellow brass solids, 15.00; yellow brass turnings, 14.00; radiators, 16.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 40.50, 2000-5000 lb lots; cast, 43.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 106.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 120.50; 200-499 lb, 119.00; 500-999 lb, 118.50; 1000 lb or more, 118.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 79.50; 100-600 lb, 70.20; 700-1900 lb, 67.40; 2000-9900 lb, 65.60; 10,000 lb or more, 64.20.

Stannous Chloride (Anhydrous): 25 lb, 155.00; 100 lb, 150.10; 400 lb, 147.70; 800-19,900 lb, 106.80; 20,000 lb or more, 100.70.

Stannous Sulphate: Less than 50 lb, 140.20; 50 lb, 110.20; 100-1900 lb, 108.20; 2000 lb or more, 106.20.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 153*)

scrap and 49.9 per cent was pig iron. During January scrap accounted for 48.9 per cent and pig iron 51.1 per cent in the total melt.

Stocks of ferrous scrap held by consumers at the end of February were 8,194,000 tons, a decrease of 2 per cent from the 8,330,913 tons held at the end of January. Stocks of pig iron were 3,311,000 tons, down 5 per cent from the 3,477,606 tons held at the end of the preceding month.

Home scrap produced accounted for 3,250,000 tons during the month, an increase of 4 per cent over January. Purchased scrap received by consumers totaled 2,264,000 tons, 13 per cent greater than during the preceding month. Of the purchased material, 85 per cent was received from dealers, the rest from other sources.

Ferroalloys . . .

Ferroalloy Prices, Pages 158 & 159

Refractomet Div., Universal-Cyclops Steel Corp., Bridgeville, Pa., has issued a new pricing schedule on molybdenum and molybdenum-titanium alloys. This book is the first of a series of pricing and availability manuals on the division's

CLASSIFIED ADVERTISING

PLANT ENGINEERS DRAFTSMEN

With experience in layout and installation of merchant bar mills. Send complete information on work history, education and personal data together with recent photograph. All replies will be held in confidence.

Reply Box 759, STEEL
Penton Bldg. Cleveland 13, Ohio

Help Wanted

ROD & STRIP ROLLING MILL SUPT. for non-ferrous & stainless wire manufacturer in Newark, N. J. area. Practical experience in hot rolling mill desirable. Full responsibility for all related operations. Send complete record to Box 751, STEEL, Penton Bldg., Cleveland 13, Ohio.

EXPERIENCED SHEET PRODUCTION SUPERINTENDENT. Immediate opening for superintendent with background in aluminum strip and sheet rolling. Prefer Mechanical Engineering Degree, or equivalent, with 3-4 years experience. Must have working knowledge of plant layout and auxiliary equipment. Modern installation in growing Mid-southern community. Independent aluminum production. In resume give age, family, references, experience and salary requirement. Enclose photograph. Reply Box 753, STEEL, Penton Bldg., Cleveland 13, Ohio.

MECHANICAL ENGINEER

Large manufacturer (approximately 2500 employees) of specialty steel products including closed and open die heavy press forgings, forged and rolled rings and flanges, desires graduate mechanical engineer with 5 to 10 years' experience in tool, die, jig, and fixture design to head this engineering function. Salary commensurate with ability. When applying give educational background, experience and salary requirements. Reply Box 758, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGICAL ENGINEER

Experience required in the manufacture and application of carbon and alloy steel plate—Philadelphia area location. Reply Box 752, STEEL, Penton Bldg., Cleveland 13, Ohio.

Mechanical Engineer

Desire graduate M. E. expert and experienced in tool design and manufacturing operations. Must enjoy flexible, creative work constantly facing him with the creative demands of new development and applications in material handling, tool design, and equipment utilizations. General supervisory and production experience desirable. Should be interested in keeping abreast of developments in modern metallurgy and advanced metal forming (stamping and fabrication) practices. Excellent opportunity for young man (28-35) now in $7,000-$9,000 range to grow rapidly through his basic contribution to a steadily expanding (non-auto) company in St. Louis. All replies kept strictly confidential. Please address resumes to: D. M. More, 9827 Clayton Road, St. Louis 17, Missouri.

BUILDINGS FOR SALE

Total of 3-Widths of 58′, 78′, and 31′, length of 600′. 2—with crane runways, 1—Capable of handling 80 Ton Crane. Located on siding; ready for dismantling; ideal for heavy industry.

Reply Box 756, STEEL
Penton Bldg., Cleveland 13, Ohio

We are interested in purchasing
SURPLUS STEEL and ALUMINUM
Sheet, strip, bars, tubing and pipe
M. R. BERLIN CO.
2900 W. PETERSON ROAD
CHICAGO 45, ILL.

WANT TO BUY

Steel By-Products Discs

2" to 2⅛"	Dia.	.060 to .125
4⅛"	Dia.	.060 to .125
6⅛" to 10"	Dia.	.060 to .125
11" to 12⅛"	Dia.	.085 to .095

Hot or Cold Rolled

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WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—

Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry. When you have an opportunity to offer, use the Help Wanted columns of STEEL.

products, including molybdenum, columbium, and zirconium in all standard mill forms.

Rails, Cars . . .

Track Material Prices, Page 144

Chesapeake & Ohio Railroad has placed orders for an additional 400 freight cars costing $5.3 million. These augment orders for 250 boxcars, costing $2.5 million, placed a couple weeks ago.

Two hundred and fifty 50 ft 6 in. boxcars will be built by Pullman-Standard Car Mfg. Co. in Michigan City, Ind., delivery to start in June. Fifty 85 ft piggyback flatcars will be built at the Berwick (Pa.) plant of American Car & Foundry Div., ACF Industries. One hundred 70-ton covered hoppercars will be constructed at the railroad's own shops at Russell, Ky.

Steel Bars . . .

Bar Prices, Page 141

While some barmakers can still work a little new tonnage into their second quarter schedules, in general, they're filled up for the period on hot bars. Some of them have closed their books for May orders. Most are entering fairly good orders for July.

May bookings of a Pittsburgh area supplier were 25 per cent above his March level. Demand for the least wanted item was equivalent to 90 per cent of the sales objective. "We'll keep our deliveries current for the next month," a sales official said, "but after that we'll probably fall behind."

Some as-rolled tonnage can be had for the current quarter in hot alloy bars, and cold drawn bars in standard sizes.

Bar requirements in New England are bolstered by rifle and machine gun contracts worth about $6 million. Saco Lowell Shops Inc., Biddeford, Maine, booked a $2.7 million contract. The new army rifle (M-14) will be built at New Haven and Springfield, Mass. New machine tools costing in excess of $1 million will be bought to fill the contracts.

Several revisions in extras on hot-rolled bars have been made by Jones & Laughlin Steel Corp. They include a change in cutting extras, quality extras, and leaded steel chemistry extras.

PETERSON STEELS, INC.

Union, New Jersey • Detroit, Michigan • Chicago, Illinois

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"Samson" Shot (chilled iron) "Angular" Grit

ANGULAR GRIT

AMERICA'S LEADING METAL ABRASIVES

The four most famous names in metal abrasives provide a size and type of shot or grit to meet every blast-cleaning need. Write for literature and recommendations.

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Arsenal Sta., Pittsburgh 1, Pa.

MALLEABRASIVE
MALLEABLIZED SHOT and GRIT

SSP TRU-STEEL SHOT

TRU-STEEL HIGH CARBON STEEL SHOT

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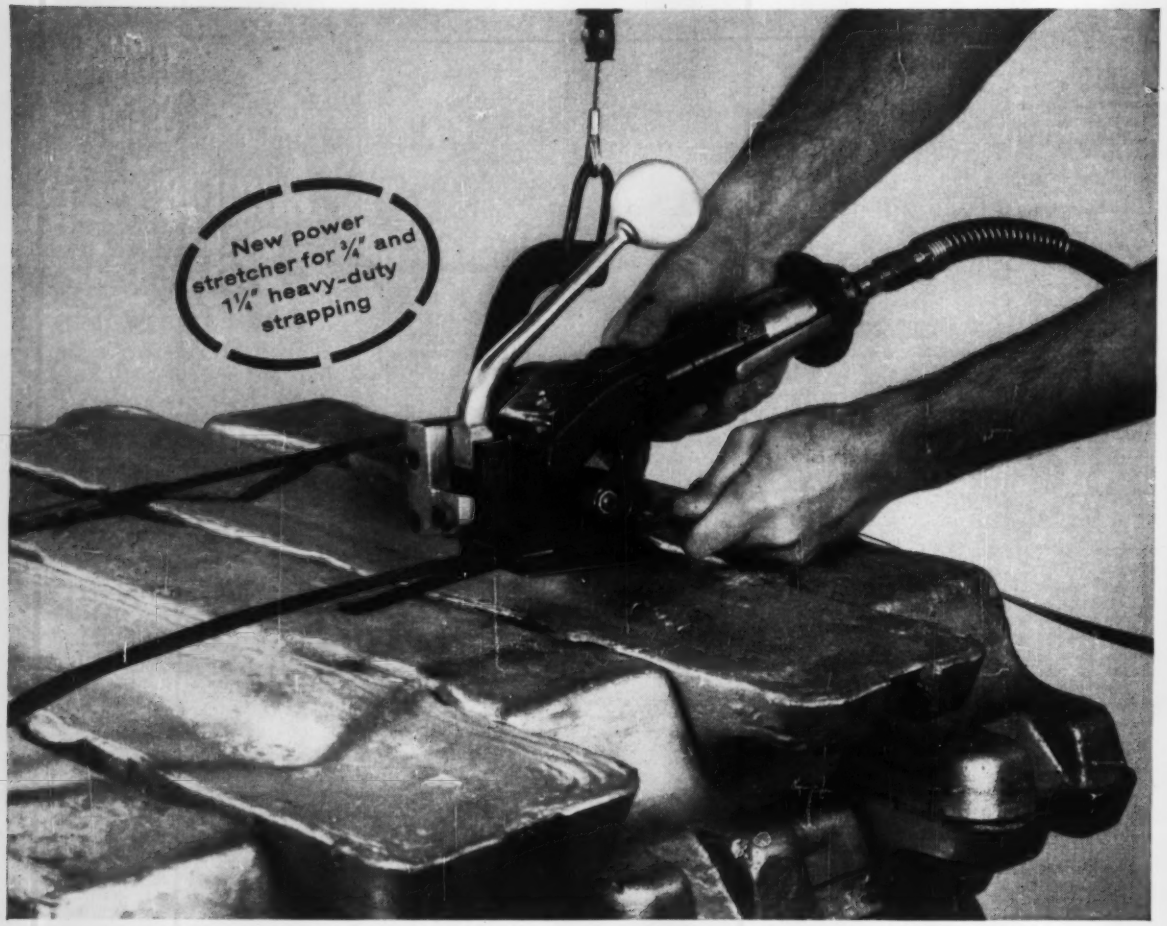


Another Acme Steel portable power strapping tool . . .

The new B1R pneumatic stretcher

ACME STEEL COMPANY adds still another model to its line of power-actuated, portable strapping tools. This time it's the rugged B1R Pneumatic Stretcher, an all-purpose tool for heavy-duty strapping—but with the accent on light weight and handling ease.

The B1R eliminates waste as it uses strap directly from the coil, features unlimited high-speed take-up and provides greater residual strap tension. Operation is simple: strapping threads easily into the tool, then a touch of the throttle power tensions strapping to predetermined tension. Motor holds tension until sealed joint is made. A forward stroke of the shear lever cuts strap close to the seal. This tool is readily adaptable to many different strapping applications. Mounting brackets and various types of supports are available.

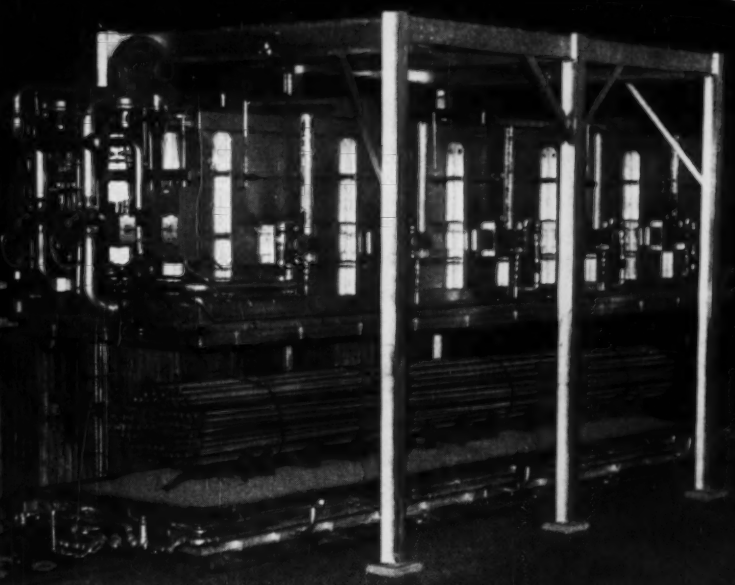
Your Acme Idea Man can demonstrate the money-saving advantages of the B1R Stretcher as it applies to your packaging operations.

Ask your Acme Idea Man—or write—for free brochure on the new B1R and other Acme Steel powered strapping tools.

Contact your Acme Idea Man at the nearest Acme Steel Company office. Or write: Dept.SDU-49, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**

...BRINGS BETTER CONTROL TO MERCHANT BAR ANNEALING

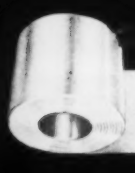


The finest control of merchant bar annealing yet known has been achieved with the new Lee Wilson Bar Annealing System, with multiple-zone control in the furnace and with radiant tube base heating with its control interlocked with the furnace zones.

These new furnaces process anneal, spheroidize and lamellar anneal to uniform physical properties because the heat is applied more uniformly and controlled with greater precision. Proper atmospheres protect against decarburization.

Shown above is the new Lee Wilson installation at a plant of a large Eastern producer of high carbon, alloy and stainless merchant bar and coils.

If annealing merchant bar, wire, rod, strip or sheet coil — steel, aluminum or brass — is part of your business, Lee Wilson has the furnace and experience to give you better results at reduced costs.



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HIGH PRODUCTION ANNEALING SYSTEMS

MAKE THE BEST METALS BETTER

ORIGINATORS AND LEADING PRODUCERS OF OPENED COIL AND SINGLE STACK FURNACES

Cold rolled anneal and pickle line at Jones & Laughlin Steel Corporation's Louisville, Ohio plant

Wean, J&L and Stainless . . .

Eleven continuous processing lines at Jones & Laughlin's impressive new stainless plant—*all designed and built by Wean Engineering*—demonstrate the versatility of Wean's abilities in this field. From conditioning of incoming coil, through annealing, pickling and surface treatment, to slitting and cut-up, these Wean lines assure Jones & Laughlin customers top quality stainless strip or sheet to meet the most exacting requirements.

In the design of this equipment, high quality surface finish of the stainless was a prime requisite—one of the reasons Wean was selected to engineer and build this multi-line installation. Whatever *your* requirements in continuous strip processing, you can benefit from Wean's *creative engineering*.

THE WEAN ENGINEERING COMPANY, INC. · WARREN · OHIO